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BURNS AND THEIR TREATMENT

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(Read before the Forty-First Annual Meeting of the Arizona State Medical Association, at Globe, Ariz., April 21-23, 1932.)

In reviewing the subject of burns in the standard books of surgery, one is at once struck with the meagerness of the subject. That there is a distinct need for such a chapter is borne out when the various methods of treatment are as varied as the writers. There should be some definite effort to improve this subject, both as to treatment and end results, for there is much to be hoped for in lessening mortality and deformities. A keen appreciation of this subject should be brought home to every practitioner who is constantly called upon to treat these cases.

The most important phase of these cases is the recognition at the very onset that the patient is suffering from shock, and later from a toxic absorption; and, if not guarded against, contractions and deformities will result.

The term "burn" is generally used to designate the lesion caused by dry heat of 140°F. and upwards, on tissues. The term "scald" signifies the lesion produced by moist heat of 125°F. and upwards.

Burns are usually classified in this country by three classes or degrees. First degree, caused by temporary action of heat from 125°F. to 140°F. Only the superficial layers of the skin are involved; an erythema—sunburn is a good example. Very little constitutional disturbance results unless extensive areas are affected. Even in this form, moderate shock may supervene; e. g., an old man, slightly demented and frail, walking across a field to a neighbor's home, was overcome and lay in the sunshine for several hours. His legs were dreadfully burned and he was brought to the hospital in shock.

In first degree burns there is (1) a dilatation of superficial cutaneous vessels in and about exposed areas, shown by the erythema; (2) exudation of serum and infiltration of leukocytes, causing swelling; (3) if not excessive, all symptoms gradually subside with scaling, a red surface appears underneath. Repair is usually rapid, all tissues returning to normal in a few hours or days.

Second degree burns, caused by temperatures from 160°F. to 210°F., affect all of the epidermis down to the capillary layers of the corium. They are characterized by blebs and bullae of various sizes, depending upon the rapidity of the transudation of exudates. The blebs are caused by the rapid accumulation of serum and its inability to escape. This form of burn is very painful. When the skin is removed from the blebs, the exposed surface is very tender to touch and to the air. If the papillae are involved, scarring usually results. Constitutional symptoms nearly always follow unless a very limited area is involved.

Infection is very apt to occur in this form, if great care is not used in handling these blebs, or if they are allowed to become too large before being emptied. The longer they remain closed, the greater pressure they exert on the sensitive and tender layers of the corium, causing destruction, and making fruitful fields for infection and later scarring. All blebs should be opened at their base as soon as they form, but do not remove the skin over them, as it acts as a protective covering for the tender underlying layer until nature forms a coating of fibrin over it.

Shock and infection are extremely prevalent; also contractions, unless guarded against.

Third degree burns. This form includes injuries to deeper layers of corium, blood vessels, fascia, muscles, and even bones; a true destruction of tissue. The eschar is usually a brownish leathery non-sensitive layer of dead tissue. The area affected by steam or excessive hot water is grayish white and bloodless. In four to five days the eschar begins to separate at the edges by a suppuration inflammatory process which gradually undermines the burned area and

causes it to slough off. If under the eschar there are any areas which have escaped destruction, they form little islands from which epithelium spreads. If the area is completely destroyed, epithelization proceeds from the edges. It is a slow process. The sloughing which occurs is saprophytic in character and it is extremely important to keep other forms of bacteria from invading this rich culture medium, and thus keep out true infection.

Shock always follows this form of burn. Pain is usually severe and constant. There is an old saying to the effect that cases of burns that do not sleep the first night, die.

No single theory satisfactorily explains the profound changes which follow a severe cutaneous burn. The theories evolved which partially explain the symptoms are: (1) Interference with the normal function of the skin. (2) Changes in the blood resulting in altered function. (3) Phenomena explained on a basis of absorption of a toxic material. Many of the older writers laid great stress upon the disturbances of the function of the skin, respiration, excretion, temperature regulation, and sensation. More recent writers are pretty well agreed that they may be contributory factors but do not explain all phenomena.

Underhill has shown that marked concentration of the blood occurs and, if this is allowed to persist, it is incompatible with life. It is known that hyperglycemia and, at times, glycosuria occur during the initial period. It has been established that blood chlorides are markedly depressed. It has been further demonsrtated that the capillaries are more permeable than normal and that blood plasma is lost into the tissues. Repeated estimates of the concentration of the blood, as measured by hemoglobin value, give excellent estimate for prognostic evaluation. An increase of 40 per cent, if maintained for any length of time, is incompatible with life. When it reaches 125 per cent of normal value, life is precarious.

Toxemia. According to many recent investigators, the toxemia theory is the most convincing; i. e., that there is at the site of the burn a toxic substance, proteid in character, the absorption of which is responsible for the constitutional symptoms.

That burns cause a definite toxic material, is proved by vascular parabiosis; e. g., of two animals having their vascular systems connected, one animal is burned. They are carefully watched. They both run temperatures. The connection is severed; the burned animal dies and the other gets well. If they are allowed to remain connected, both die.

A FEW FACTS RATHER ARBITRARILY STATED

1. All burns of the first degree are fatal if two-thirds of body surface is burned.
2. All burns of the second degree are fatal if one-half of the body surface is involved.
3. All burns covering one-third of the body surface are exceedingly serious, if not fatal.
4. All burns covering one-tenth of body surface should be considered serious.
5. In the new-born, a burn one-tenth to one-twelfth of body surface is invariably fatal.
6. Burns of abdomen give highest mortality.
7. Burns of genitalia, anterior thoracic surface, and face, cause symptoms out of proportion to the area of allotment.
8. Burns of flexor surface are more dangerous than those of extensor surface.
9. First week after accident is most fatal for burns.

TREATMENT

1. Give morphine enough to control pain.
2. Place patient in a warm room.
3. Apply external heat.
4. After pain is relieved, remove clothing very gently.
5. Force fluids by mouth.
6. Give intravenous glucose, 5 per cent, in normal saline solution, later by proctoclysis, hypodermoclysis.
7. Use stimulants; caffeine.

Local Treatment: Accepting the toxemia theory as the most plausible one, the rational treatment is one that will prevent the absorption of the toxic material. We turn to tannic acid. Davidson in 1925 brought it into general use and it has revolutionized the treatment of burns. Tannic acid is an amorphous powder which is readily soluble in water, glycerine, and alcohol; insoluble in ether or chloroform. It precipitates protein. Thus, it precipitates the devitalized tissues of burns and thereby prevents the absorption of toxic substances into the circulation. It forms a protective coating against chemical, bacterial, and mechanical, action as well as against sensory and inflammatory irritation.

Apply a 2.5 per cent to 5 per cent solution of tannic acid in water. It is essential that a fresh solution be made each time it is used. Spray afflicted area. Dry by means of lamps. Use a 200 Watt lamp if no other means are available. Repeat the procedure till eight or ten layers are made, or until the whole area is brownish.

As blisters occur, puncture them so that the serum can escape and allow tanning of the tissue. Pain is

diminished; it is rarely necessary to give opiates after first 24 hours. Keep wound exposed, put cradle over affected parts covered with a sterile sheet. Tan the area each day.

The tanned area forms a thick, leathery, protective covering. Healing goes on under its surface with surprising results. There is no absorption, no infection. It is amazing how large, extensive areas will completely heal under this plan of treatment. Caution: Do not use any softening lotions on parts, as boric acid, et cetera; else you will have a reabsorption of toxic material.

Tannic acid is the ideal burn dressing, because: (1) It is analgesic—protects nerve endings; (2) it lessens toxemia; (3) it is a protective dressing; (4) scar formation is less; (5) scar tissue is much more pliable than other scars; (6) contractions are less.

CASES

Case No. 1. M. T., girl, aged 6, weight 40 pounds, height 50 inches. September 20, 1931, clothes caught fire from a carbide lamp. She was burned on the left side of body from axilla to knee. Burns were of second and third degree. She was brought to my office, a distance of 8 miles. She was first given morphine sulphate gr. ⅛, to relieve pain. Treated with 2½ per cent aqueous solution of tannic acid applied to the burned areas on layers of gauze. These were changed daily but kept saturated with tannic acid solution.

Fig. 1. Photograph of left side of patient (Case 1), showing scars and bands of normal skin where elastic bands of bloomers gave partial protection.

Fig. 2. Frontal view of patient in Case 2, after recovery.

All areas were healed by February 1, 1932. No grafting was necessary. Epithelization was good. There are no contractions; all motions are perfect. About the waist and thigh can be seen two bands of normal skin where the elastic bands of her bloomers protected her from being more deeply burned. These bands have afforded ample play between burned areas and have seemingly stretched. No infection whatever.

Case No. 2. A. H., age 13, weight 101, height 64 inches, was burned January 4, 1932. He had prepared to go to bed, dressed in canton flannel pajamas, with a heavy woolen dressing gown over them. As he was sleeping on an open porch and the weather was very cold, he took a hot water bag to bed with him, filled with boiling water. He drew the hot water bottle across his abdomen, when it burst, scalding him. The heavy clothing about him retained the heat and caused more extensive and severe burns than would otherwise have resulted. He was burned from lower costal arch to middle of thighs on all sides of body. The burns were all of second and third degree.

He was given morphine sulphate grs. ⅜, to get him easy, and this was the last morphine that he needed. His treatment was 2½ per cent to 5 per

Fig. 3. Posterior view of patient in Case 2.

Fig. 4. Right lateral view of patient 2.

cent aqueous solution of tannic acid. It was applied every hour and dried until 8 or 10 layers had been applied. It caused a tanning of the burned area and the portions where the body was burned to third degree, a thick black tenacious covering. The third day, he began having a high temperature. This persisted for several days and then gradually subsided. Fluids were crowded. The urine for a few days was very high-colored but never had any albumin, blood, or abnormal finding. There was never any infection and no skin grafting. The resulting scars are soft, pliable, and he has perfect motion, no contractions. Finally discharged April 1, 1932.

Fig. 5. Left lateral view of patient 2.

DISCUSSION

DR. E. W. ADAMSON (Douglas): I have never had any experience with tannic acid. In my work at the smelter, burns frequently occur, and we have used picric acid in a vaseline dressing, combined with a local anesthetic. A very severe and extensive burn is a great deal like a generalized peritonitis: there is nothing much you can do that avails. I am glad to hear that Dr. Bledsoe has had such success with tannic acid.

DR. W. A. HOLT (Globe): I believe we have all been a little slow in recognizing the severity of burns. I believe that picric acid is very good for their treatment because it is both an antiseptic and an anesthetic.

DR. C. E. IRVIN (Miami): In the last year the Lily Company has put out a preparation with 5 per cent tannic acid. I used it recently in a case and found that tanning took place in just two applications, and that healing followed satisfactorily.

DR. GEORGE GOODRICH (Phoenix): I believe that the reason tannic acid solution in the treatment of burns has not been more extensively used, is that it has to be freshly prepared. In hospital practice it is comparatively simple, but in lay practice it requires more time. Burns are very painful wounds. The patient and family wish relief secured immediately and are unwilling to wait for the doctor to secure a freshly compounded solution at a drug store and have it sent to the home.

DR. H. W. R. RICE (Morenci): It is in extensive burns that the tannic acid treatment is of particular importance. Unless the doctor is the first to treat the burn he will probably find that some greasy substance has been applied. In such case, every trace of grease should first be removed by ether before the tannic acid dressing is put on.

DR. BLEDSOE (closing): Scars resulting from burns treated with tannic acid are softer, more pliable, and do not contract as do ordinary burn scars.

THE NEUTROPHILE LEUKOCYTE

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(Read before the Forty-first Annual Meeting of the Arizona State Medical Association, held at Globe, Ariz., April 21-23, 1932.)

Following Hewson's discovery of the colorless corpuscles of the blood, our knowledge of these cells was of rather slow development until Ehrlich introduced his method of fixing and staining blood films and made possible a classification based on their morphology and reaction to anilin dyes. The commonly accepted classification is: polymorphonuclear neutrophilic leukocytes, polymorphonuclear eosinophilic leukocytes, polymorphonuclear basophilic leukocytes, lymphocytes, transitionals, and mononuclear leukocytes. The polymorphonuclear neutrophilic leukocytes are by far the most numerous of the leukocytes in the circulating blood and occupy the most prominent place in the reactive process against pyogenic infections. Morphologically the neutrophilic leukocyte is distinguished from all other cells of the body by the contour and structure of its nucleus. At first it was considered as composed of multiple nuclei, but, by improved staining technic this is shown to be a single nucleus with multiple lobes connected by thread-like filaments or broader bands of chromatin. The number of lobes varies from two to five, though even eight or nine are occasionally seen in certain pathologic conditions, notably, in pernicious anemia and multiple myeloma. This cell shows a characteristic granular structure of its cytoplasm when stained by usual methods. Ehrlich's original stain was a triple stain made up of acid, basic and neutral dyes, and these granules showed affinity for the neutral dye; hence, the term neutrophilic. These granules vary much in tone, apparently depending on the age of the cell, the younger cells reacting more to the basic dye, while the more aged show eosinophilic tendencies. The relative age of an individual cell is indicated also by the conformation of its nucleus, the more mature cells having nuclei in the form of two to five lobes connected by filaments of nuclear material, while in the immature cells the nuclei are in single masses of irregular contour.

The neutrophilic leukocyte belongs to a group that may be called "end cells"; that is, cells which are incapable of further differentiation or multiplication. It is the product of differentiation of the neutrophilic myelocyte of the bone marrow. During this process of change, a non-motile cell is endowed with motility, a spherical nucleus becomes lobulated, and the characteristic granules are increased. In the bone marrow these maturing cells are massed in groups of leukogenic centers, the more mature at the periphery and adjacent to a thin-walled venous sinus, apparently waiting for the moment when they shall enter upon adult life. These leukogenic centers normally furnish sufficient numbers to meet physiological demands, but when pathological conditions arise, additional centers are developed to supply the excessive requirements, these new centers replacing adipose tissue of the bone marrow. The new cells enter the blood stream by their own ameboid movement, this function of motility not being called into use again during the normal physiologic life of the cell.

When not called upon to resist infection, this cell passes its existence in the blood stream after it has emerged from the bone marrow. The length of this existence has not been determined, but is probably measured by days or, perhaps, even by hours. Fragmented cells are found in any blood film. These dead or dying cells are filtered out by the spleen and liver.

Under strictly physiological conditions this cell can be assigned no definite function and rapidly passes to its grave in the spleen and liver. However, upon the invasion of the body by pathogenic organisms, it forms the first line of defense. This is

especially true when infection by pyogenic bacteria occurs, but is true to a greater or less degree in the exanthemata and practically all acute infections.

The importance of these cells in the reaction to infection was recognized in an incomplete way by Metchnikoff, and they were given a prominent place in his theory of phagocytosis. Prone to jump at conclusions rather than arrive at facts after careful investigation, he, nevertheless, was partly correct. With his crude lens he observed wandering cells with ameboid movement and saw them, in star-fish larvae, pick up carmine granules which he had injected. From this he concluded that they must eat up microbes also and so protect star-fish larvae from infection. He wrote, "our wandering cells, the white cells of our blood, they must be what protect us from invading germs; they are the cause of immunity to disease; they are what keeps the human race from being killed off by malignant bacilli." From this imperfect piece of research, it has required many years of precise and carefully controlled investigation by Koch, Ehrlich, and illustrious followers, to arrive at our present knowledge of immunity and the part played in the process by the leukocytes.

Neutrophilic leukocytes are normally found only in the blood stream and bone marrow, and are never found in the tissues, as are the lymphocytes. Just as this cell arrived in the blood stream by its own motility, so it passes through vessel walls into the tissues by its own ameboid movement, when it is called out by a positive chemotaxis in the face of an infection. Apparently there are many chemotactic substances, some more active than others, probably the most active being one, of undetermined character, present in necrotic tissues. By virtue of its possession of a proteolytic enzyme it takes part in the digestion of necrotic tissues and aids in the autolysis of exudates as in lobar pneumonia. It has been thought that this cell could not be a factor in antitoxic or bacteriocidal immunity, for the reason that it is an end cell and has no offspring to whom it can bequeath this characteristic. It is in the presence of acute pyogenic infection that the neutrophile leukocyte finds its most important field of activity, and when so called upon, passes from the blood stream into the tissues and, coincidently, the reserves in the bone marrow are called out, resulting in a leukocytosis.

The average normal leukocyte count is usually placed at 7500 per cubic millimeter, but this may vary according to the time of day, certain investigations showing a reduction of as much as 5000 cells in counts made at 2 to 4 a. m. as compared with those made in the afternoon. Sabin found half-hour variations of 2000 cells. However, in the face of unexplained variations, the total leukocyte and differential count is the most frequently used laboratory procedure and is deserving of this preeminence if properly interpreted and correctly correlated with the clinical findings, as it discloses an intimate insight into the reactive changes taking place between the body and an invading infection.

The more practical application to clinical diagnosis of the changes in the leukocytes as a result of acute infection, was given by Sadler in 1892 and by Cabot in 1894, showing that a leukocytosis is usually found in exudative diseases except in tuberculosis; and Wilson in 1901 called attention to the finding that in purulent conditions the percentage of neutrophiles was usually above 80 per cent. It was Sondern, in 1905, who formulated a rational explanation of these reactions to acute infections. He expressed the opinion that the degree of leukocytosis indicated the amount of body resistance, that the degree of neutrophile-cell increase indicated the severity of the infective process and that the value of this laboratory examination in diagnosis and prognosis lies not in either count alone, but in both and their relationship.

In order to portray this relationship graphically, Gibson devised a chart which shows at a glance the relative height of both counts, thus giving a clear-cut picture of the degree of body resistance as compared with the severity of the infection. He took a leukocyte count of 10,000 as the upper limit of normal, and 75 per cent of neutrophiles as the high normal, and on his chart places these on the same horizontal line. He calculated that each rise of 1,000 in the total count should be accompanied by a 1 per cent rise in the neutrophile count. So long as this proportion was maintained the figures could be connected by a horizontal line, which was interpreted to mean that the body resistance was proportionate with the severity of the infection. If the nuetrophile count is relatively high, the chart shows an ascending line, indicating that the resistance is becoming overwhelmed by the severity of the infection. On the other hand, a neutrophile count relatively low leads to a descending line, indicating that the body resistance exceeds or is overpowering the infection.

In 1904 Arneth proposed a definite formula for normal neutrophile cells on the basis of the number of the lobes of the nucleus, and interpreted deviations

from this standard as being of value in prognosis. This formula is based on the theory that, as the age of a neutrophile cell increases, the number of its lobes increases, and also that the young cells are thrown into the blood stream as an addition to the defense force against an overpowering infection. This theory must also assume that all these cells start out with an equal chance in life and that each one shall pass from a single-lobed nucleus to a five-lobed, at the same rate of speed. Arneth divided the neutrophile cells into five classes and these were subdivided, and in addition there were classes and subdivisions of lymphocytes and mononuclears, making in all eighty-one subdivisions. This formula is very interesting but much too complicated for practical use and the large variety of cells to be computed permits the injection of such a degree of personal equation that its value is definitely reduced. However, we are indebted to Arneth for showing that the age of the neutrophile is indicated by the extent of nuclear segmentation and that in acute infections the immature cells increase in number, increasing with the intensity of the infection and declining as convalescence and recovery occur. This increase of immature forms is evidently due to a breaking down of the normal balance of leukocytic formation and destruction, the presence of a leukocytosis being the result of stimulation of the leukogenic centers by bacterial toxins, and leukopenia due to inhibition of these same centers.

In 1920 von Schilling presented a modification of Arneth's formula, greatly simplifying the classification and rendering the count of much greater clinical value. He made four divisions of the neutrophile cells, placing all those with segmented nuclei in class four, groups one to three inclusive being made up of myelocytes and other immature forms.

Both Arneth and Schilling emphasized the importance of studying the nuclear conformation and showed that, in severe acute septic processes, the cells with nonlobulated nuclei were definitely increased, a phenomenon to which was given the name "shift to the left," or "regenerative shift." The prognostic value of this change was recognized and Schilling, after citing a case of sepsis, says, "thus we see that the shift accompanies the whole septic process in a very definite and significant fashion, often effectively supplementing the clinical findings and at times elucidating and surpassing the clinical data."

Methods intended to simplify the classification of neutrophiles in order to show these qualitative changes have been proposed by Pons and Krumbhaar, Cooke and Ponder, and by Piney. Cooke and Ponder prepared a classification based upon the divisions of the nucleus connected by chromatin filament, those with an undivided nucleus in class one, those with two lobes in class two, and so on for classes three, four and five. Farley, St. Clair and Reisinger, in reviewing the classifications already proposed, came to the conclusion that the essential, practical point is the separation of the young forms from the more mature and highly differentiated cells, and suggested two divisions, the "non-filament" and the "filament neutrophiles," placing in the former division those of Cooke and Ponder's class one, and in the latter those of classes two to five inclusive. Blood counts in 190 presumably normal adults, gave an average of 8 per cent non-filament cells and they placed the high normal at 16 per cent, although recognizing this as a somewhat arbitrary figure. They considered this to be the most delicate method of studying the reaction of bone marrow to infections, and to be of especial value in diagnosis of cryptic infections.

Recently Mullen and Large emphasized the prognostic value of this procedure and, in reviewing a large series of cases, found that non-filament counts of 50 per cent and over offer a very guarded prognosis, most of such cases terminating fatally. They found that a filament-nonfilament count follow more closely the course of an infection than the total leukocyte count and was valuable in foretelling complications arising during convalescence.

This classification of filament and non-filament neutrophiles can be made with only a very small expenditure of time and by any trained laboratory technician and we believe should come into more common use. Its greatest value will be found when considered in relation to the total and differential leukocyte count and correlated with the clinical findings. In order to portray this graphically, I have prepared a modification of the Gibson chart so arranged that both the neutrophile percentage and non-filament count will be shown and their relationship with the total leukocyte count. Chart 1. On this chart, an ascending line should be considered as a danger signal while a transverse or descending line suggests a satisfactory reaction. In the patient giving the count indicated by line A, which was a case of acute appendicitis, with total count of 15,000—85 per cent polynuclears and 55 per cent non-filament forms—the prognosis is much more grave than in the patient with the count indicated by B, where the total count is 30,000 and polynuclear neutrophile percentage 90 per cent, but the non-filament count

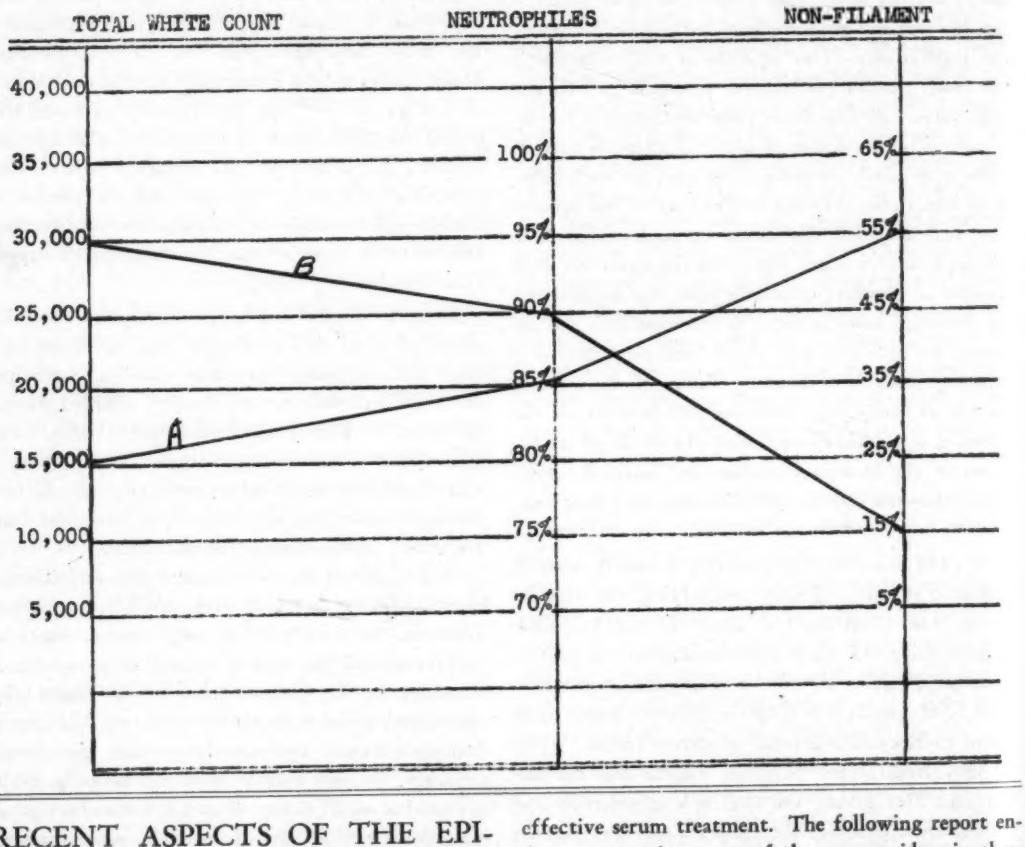
only 15 per cent. It is also recommended that in acute and post-operative cases, daily counts be made and that these be charted on the same sheet so that deviations from day to day may be noted at a glance.

The value of frequently repeated blood counts in acute infections cannot be over-emphasized, as they give us from day to day a picture of the patient's resistance as compared with the severity of the infection, and the findings are easily interpreted at a glance when graphically portrayed on a chart.

DISCUSSION

DR. ROBERT S. FLINN: I am more or less familiar with the blood work that Doctor Mills has been carrying out, and have been following its results with considerable interest. There is no doubt that a great deal can be gained from filamentous and non-filamentous forms. However, from my experience, I believe it is well to combine this information with that obtained from studies of the total white count together with monocytic and lymphocytic ratios.

Chart 1



RECENT ASPECTS OF THE EPIDEMIOLOGY AND THE SERUM TREATMENT OF POLIOMYELITIS

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The recent advances in the knowledge of poliomyelitis have largely been along the lines of epidemiology and immunity, together with the search for an effective serum treatment. The following report endeavors to review some of the current ideas in these fields and is augmented by recent experimental observations.

*From The George Williams Hooper Foundation of the University of California, San Francisco.

EPIDEMIOLOGY

Poliomyelitis is a disease of the temperate or colder climates and becomes less prevalent nearer the equator. At the same time, it also has a seasonal variation, being more frequently present during the summer and autumn than in the winter or spring, although sporadic cases are occasionally reported for the latter seasons. This seasonal variation holds true for the southern as well as for the northern hemi-

sphere. In Australia and New Zealand, the peak of the morbidity curve is in February and March, when the climatic conditions correspond to ours for August and September. This variation was also illustrated in the 1930 epidemic in California, when there were two peaks in the curve, one in July for southern California, and another in October for San Francisco and vicinity, corresponding to our period of warmer weather.

Aycock (1928) believes that the age distribution of poliomyelitis corresponds to that for measles and for diphtheria; that there is a greater preponderance of cases in the younger age groups in urban than in rural communities for all three diseases, and that the case incidence in the various age groups is directly proportional to the concentration of the population. Reasoning from the similarity of the age distribution of poliomyelitis, measles, and diphtheria, Aycock deduces that the age distribution in poliomyelitis is dependent upon immunity, largely subclinical. He shows that, although this disease has a lower incidence in the southern United States than in the northern, the age distribution is of the same order in both sections. He believes this is an indication that immunization in the South is just as rapid as in the North, and that early infection in the South may account for the relatively more extensive subclinical immunization.

Aycock and Kramer (1930) have given experimental evidence to show that serum from a group of normal adults in a southern population was capable of neutralizing the virus *in vitro*. They obtained neutralization with eighteen out of twenty-one serums from people giving a negative history of poliomyelitis. They have also found that serums from other groups of so-called "normal" individuals contained neutralizing antibodies for the poliomyelitis virus, while in another report they have shown that there is a passive transfer of immunity from mother to infant. This, however, is only transient, as evidenced by the susceptibility of children between 1 and 5 years of age. They found that the serum of urban mothers and their newborn infants gave a positive neutralization test in 83 per cent of the children and in 83 per cent of the mothers, with a complete correspondence between mother and child.

Other workers have also reported upon the neutralizing ability to be found in the serums of normal individuals. Shaughnessy, Harmon, and Gordon (1930) obtained positive tests in serums from ten normal adults and six normal city children, in dilutions as high as 1 to 30 in the majority of cases. Fairbrother and Brown (1930), Faber (1930), Schultz and Gebhardt (1931), Soule and McKinley (1931) and Brodie (1932) all have reported upon this same characteristic of certain supposedly "normal" serums.

From the findings of these different men in regard to immunity in people showing no history of poliomyelitis, and since apparently the disease is irregular in its attack rate, it is quite probable that a wide-spread immunization, especially in urban districts, must occur early in life, either due to subinfective doses or to an abortive attack of the disease. Kramer and Aycock (1931) have recently shown by neutralization tests in monkeys that the same degree of immunity occurs among a group of suspected abortive cases, as among a normal group of children, so that immunization probably occurs throughout the year and not entirely at the time of an outbreak.

Although Aycock favors the theory of subclinical infection, yet he also advances a second hypothesis (1929) to account for this general immunization, what he calls "autarcesis" (Greek, self, keep off), or the ability inherent in the physiological constitution that renders a person less susceptible to the disease. This is in contrast to immunity acquired from direct infection.

SUSCEPTIBILITY

The work of these men may throw some light on the wide variation in individual susceptibility even within one family. Many children, though exposed, never contract the disease, while parents developing poliomyelitis may not necessarily infect their children.

According to MacAusland, the susceptibility rate of individuals under 13 years is about 2 per cent. The most susceptible age period is 2 to 5 years, with 2 the age of greatest susceptibility. The disease, however, is not confined to children, as is now well known. This was illustrated in the 1930 California epidemic, when there were many cases over 18 years of age, with a high mortality rate.

Draper has advocated the idea that individuals with certain types of features are more susceptible, while Jungleblut and Engle have recently reported that injecting extracts of pituitary glands into young monkeys rendered them immune to subsequent infection with the virus. These findings may perhaps be correlated with Aycock's theory of autarcesis, so that, in the future considerations of immunity, one may have to take into account the inherent physiological constitution of the individual.

SERUM TREATMENT

The use of serum treatmet was first advocated by Netter in France, about 1910 and 1912. Since then several types have been tried: (1) normal human serum, (2) Rosenow's antistreptococcus horse serum, (3) convalescent human serum, (4) hyperimmune horse, sheep, and goat serum.

1. Normal Human Serum. Since, as previously mentioned, a number of people have reported the presence of antiviral substances in the blood of so-called "normal" individuals, such tested antiviral serums have been advocated in the treatment of poliomyelitis. The serum from a group of blood donors was used by Faber of Stanford University, in 1930, since he had found that ten out of thirteen donors possessed serum with neutralizing antibodies. No published record has been made of the results.

2. Rosenow's Antistreptococcus Serum. Rosenow (1930) strongly advocates the use of a horse serum containing antibodies against the streptococcus which he considers to be the etiological agent of poliomyelitis. He has treated over 1300 cases with it and considers the results favorable. Stewart and Haselbauer (1928), on the other hand, were unable experimentally to obtain any neutralization of the virus with Rosenow's serum, either concentrated or unconcentrated. They do not consider that there is any sound basis for its therapeutic use.

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This method of administration was used exclusively in the Canadian epidemics of 1928 and 1929,—25 cc. of convalescent serum being given as the standard amount. During the past few years in California the intramuscular treatment has been recommended and used extensively, especially in the northern part of the State.

Since 1928, the Hooper Foundation in San Francisco has endeavored to maintain a supply of convalescent plasma and to act as a collecting and distributing station for the central part of the State. During the epidemic of 1930, there was 22,725 cc. of plasma from recovered cases distributed to various doctors or hospitals in sixteen different counties. During the height of the epidemic in September and October, an average of 400 to 500 cc. of plasma was sent out in one day.

In order to maintain such a supply, the following methods were employed: A list was kept of recovered poliomyelitic cases, including name, address, telephone number, date of recovery, and so forth. The names were usually obtained either through the agency of the local newspapers or from different hospitals receiving such cases. The donors either

came to the laboratory to be bled or some one called at their homes. Excellent cooperation was received from the Health Departments of several cities where the Health Officer had gathered the recovered patients into a central place so that many could be bled at one time.

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In estimating the results of these experiments, it is evident that there was neither 100 per cent cure for the treated animals nor 100 per cent fatality among the untreated ones, but, as far as could be judged, the intramuscular use of serum from convalescent monkeys was as effective as the combined intraspinal and intravenous method. It was also clearly shown that to be effective the serum should be administered during the prodromal or preparalytic periods, since paralysis, or even death, was not prevented when treatment was delayed until the more advanced stages.

4. Hyperimmune Serum. Although no laboratory animal except the monkey has proved susceptible to inoculation by the poliomyelitis virus, yet various attempts have been made to immunize so-called "refractory" animals to the disease in order to obtain a standardized immune serum for therapeutic purposes.

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SERUM TREATMENT

The use of serum treatmet was first advocated by Netter in France, about 1910 and 1912. Since then several types have been tried: (1) normal human serum, (2) Rosenow's antistreptococcus horse serum, (3) convalescent human serum, (4) hyperimmune horse, sheep, and goat serum.

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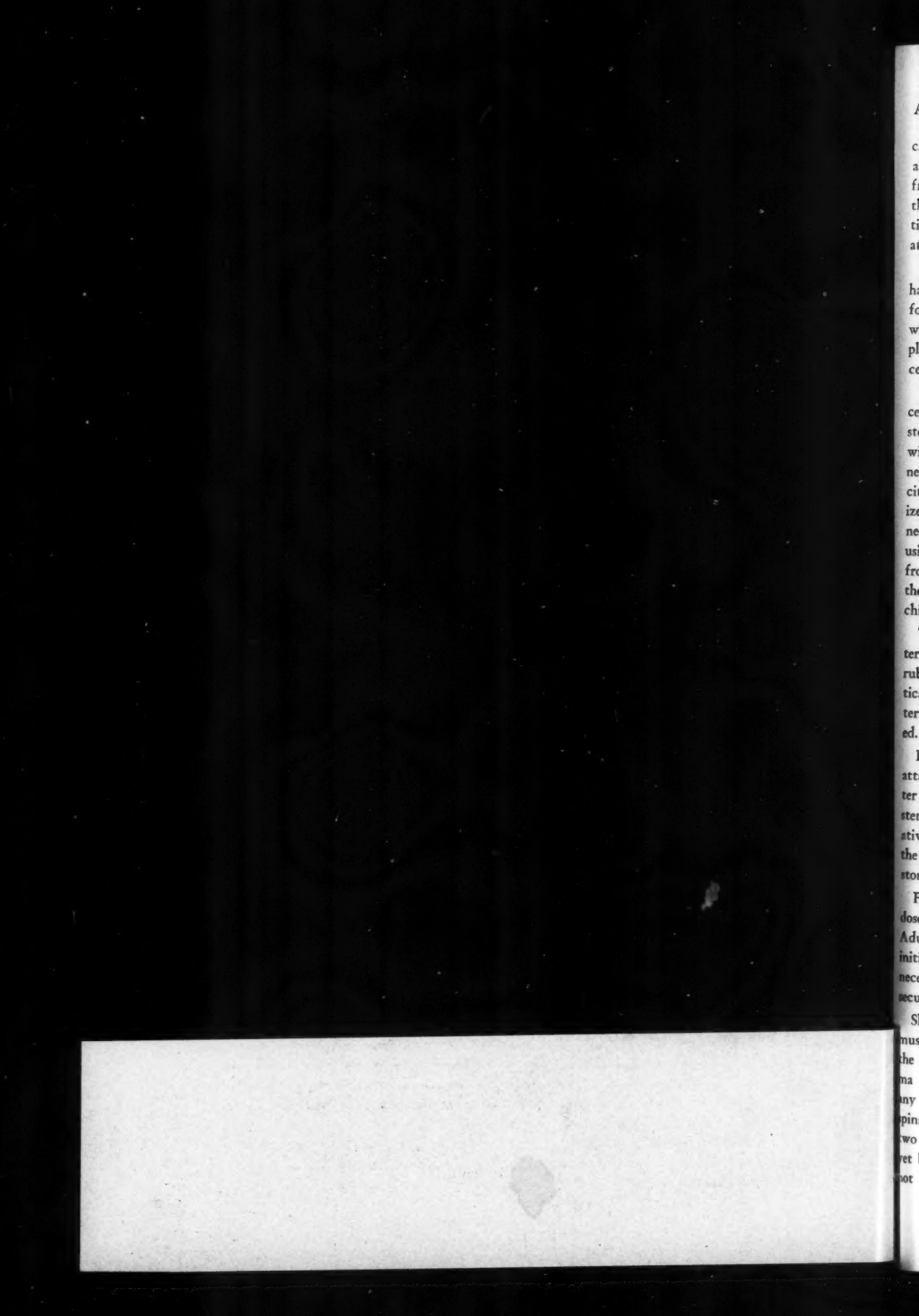

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Shaw and Thelander have advocated the intramuscular method of treatment, principally because the rate of absorption is rapid and because the plasma can be easily and quickly administered without any of the dangers accompanying either the intraspinal or the intravenous injections. Although the two latter routes are undoubtedly the most direct, yet both entail certain technical difficulties that are not met with in the intramuscular method.

In order to compare the three different methods of serum administration, experiments were conducted in monkeys (Howitt, 1932) in which the treatment was carried out according to methods similarly used in human subjects. Fifty cubic centimeters of tested convalescent monkey plasma was used as a single dose for the intramuscular method, while 5 cc. of serum was usually given intraspinally and 20 cc. intravenously. Seventy-nine monkeys were used in five different experiments, in two of which the virus was injected intracranially and in three intranasally. Of fourteen animals treated intramuscularly during the preparalytic stage, an average of 81.6 per cent recovered, although all except one had some form of residual paralysis, while an average of 18.4 per cent died. Of eleven treated in the same stage of the disease by the combined intraspinal and intravenous method, an average of 33.3 per cent recovered, though not without paralysis, while the mortality averaged 66.6 per cent. In the group of fourteen untreated controls, 54 per cent recovered with varynig degrees of paralysis, while 46 per cent died. The mortality was about 100 per cent when treatment was given by either method in fourteen animals showing early or advanced paralysis.

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4. Hyperimmune Serum. Although no laboratory animal except the monkey has proved susceptible to inoculation by the poliomyelitis virus, yet various attempts have been made to immunize so-called "refractory" animals to the disease in order to obtain a standardized immune serum for therapeutic purposes.

In 1918, Pettit in France reported the successful immunization of a sheep, and later a horse, to the virus. These serums of Pettit have been used in Europe during the past few years with varying degrees of success.

In the United States, Meyer, Park, and Banzhaf, in 1929 and again in 1931, have reported on the preparation of an antiviral horse serum which they

have been able to concentrate by precipitation methods. Fairbrother in 1930, and Schultz and Gebhardt in 1931, obtained an antiviral horse serum that neutralized the virus in the laboratory experiments but was not used in human therapy.

Recently (1932) we have been able to report the successful production of an antiviral serum by immunization of two goats and a sheep to poliomyelitis virus. They were given weekly inoculations of centrifugated, unfiltered 5 or 10 per cent brain and cord suspensions from monkeys succumbing to experimental poliomyelitis. During the past year two more sheep have also been immunized.

The serum from trial bleedings was tested by the *in vitro* neutralization method. Different amounts were added in series to 0.3 cc. of a 5 per cent virus suspension. The mixtures were incubated at 37° C. for two hours, kept on ice over night, and injected intracranially into separate monkeys. Control animals given mixtures of virus and normal sheep or goat serum were injected at the same time. Recent tests have shown that neutralization occurs with the serum of one sheep (117) in a dilution of 1 to 100, and in the others (404, 484) in a dilution of 1 to 200.

Experimental evidence has also been given to show that there is a certain protective power to these serums when used prophylactically before the virus inoculation.

In order to determine the potency of stored immune serum, samples from sheep 117 were again tested for neutralizing power, after being stored in the icebox for five, seven and ten months, respectively. Of the undiluted serum kept for ten months, 0.1 cc. neutralized 0.3 cc. of 5 per cent virus, as did also the same amount when stored for seven months. It is evident, therefore, that the sheep serum retains its potency for some time.

Poliomyelitis, as demonstrated experimentally in monkeys, is a more severe disease than that found in men. It is, therefore, interesting to note the results of using the serums from both the goats and one sheep (117) in a small series of cases during the 1930 epidemic in San Francisco. As reported last year they were used at this time by Doctors Shaw, Thelander and Limper, at the Children's Hospital.

Of the twelve cases treated in the preparalytic stage with animal serum, eight showed complete recovery, and four only transient paralysis. Of the four treated in the same stage with a combination of animal and human serums, two showed no ill effects and two had transient paralysis with subsequent recovery. Three cases were given the animal serum alone after onset of paralysis, and, of these, one died, one showed permanent paralysis, and the other recovered. Eleven people were treated with the combined serums in the same stage. In this group there were two deaths, six cases with permanent and two with transient paralysis, respectively, while one recovered.

These results, especially among the preparalytic cases, compare very favorably with those for the convalescent serum alone and give encouragement for the use of a known standard serum available in large quantities.

In considering the use of these different advocated serums, one may say (1) that there is no experimental evidence in support of Rosenow's antistreptococcus horse serum; (2) that tested normal human serum may prove effective, but has not yet been given sufficient trial; (3) that the administration of known standardized hyperimmune serum is theoretically sound but the results are yet to be reported for a large number of human cases, while (4) the use of convalescent human serum has both experimental evidence in its favor and the benefit of many years of practical application. So far, just as with the treatment experiments in monkeys, there has not been given any clear-cut demonstration of its assured constant effectiveness, as especially shown in the mentioned report of Kramer and Aycock. It may be of value with certain workers, when given early in the preparalytic stage, but in the hands of others it may prove a disappointment.

Although the use of human convalescent serum is apparently a rational procedure and has been extensively employed, yet the results have lacked uniformity. Certain questions, therefore, naturally arise in connection with its administration. It has been more or less taken for granted that, since serum from certain recovered cases contains neutralizing antibodies, all such serums should contain these substances. In a sudden outbreak of the disease, there is seldom time nor the available monkeys to make a detailed examination for the neutralizing ability of each serum. It is usually presumed that, since the individual had recovered from an attack of poliomyelitis, the serum has a certain neutralizing value. Probable differences in the potency of each serum are conceded, however, so that a pool of several is advocated. That there is this difference in pools has recently been given by Brodie (1932) in Montreal, who reports that "pooled serums from various groups may vary considerably in their strength."

The following questions, therefore, arise in considering the choice of a suitable donor: (1) What is the neutralizing value of each human convalescent serum? (2) Is the serum from a badly crippled individual as potent as that from a spontaneously recovered case, or from one showing only a slight residual paralysis?

Since the majority of the future convalescent poliomyelitic cases will have received some type of serum treatment, other questions naturally follow: (1) Should one presume the presence of antiviral substances in the blood of patients who have themselves been recently treated with the serum from recovered cases? (2) Can their serums be of service to new cases or has there been merely a passive transfer of antiviral substances without actual development of antibodies?

Since these points seem worthy of consideration, two series of neutralization tests were undertaken on the serums from recovered poliomyelitic cases.

In one series, serums were obtained from twenty-two individuals who had been treated either with human convalescent serum, immune poliomyelitic sheep serum, or with a combination of both. They were largely taken from recently recovered cases at intervals varying from seven to fifteen days, to over four years after the onset of the disease.

From the neurtalization tests it was found that: (1) Only 6 (27.2 per cent) of the twenty-two serums completely neutralized the 5 per cent virus; (2) Two (9 per cent) gave a partial protection in the monkeys, while (3) fourteen (63.6 per cent) gave no protection against the virus.

The control monkey in each case developed the disease.

Of the six cases giving a positive neutralization test, three had completely recovered from the disease, while the other three had varying degrees of paralysis with subsquent recovery. Both of the patients whose serums gave a partial neutralization had shown some paralysis. Of the fourteen other individuals giving a negative test, three had extensive and three transient paralysis, while eight completely recovered. Serum from four cases was tested twice, once after recovery and again ten months to one year later. In each instance the results were the same.

In the second series, tests were made on the serums of twenty individuals on the donor list, who had not received serum treatment. Eight (40 per cent) of the group gave positive neutralization. One (5 per cent) gave partial results, while eleven (55 per cent) gave no protection against the virus.

Those giving a positive test had either completely recovered from the disease or had shown a transient paralysis with subsequent recovery. It may be emphasized that, in this group, no positive neutralizations were obtained with serum from badly crippled cases, while the potent serums were mainly from individuals showing the least after-effects.

In considering the results of these two sets of experiments, one is mainly impressed by the lack of neutralizing ability shown by a large percentage of the recovered cases in both groups. It is also seen that there were fewer positive neutralization tests in the group receiving treatment than in the untreated series.

Therefore, while the administration of convalescent serum may not necessarily interfere with the development of antiviral substances, apparently, from these figures, antibodies were less strongly developed in this series when passive transfer occurred. In the second series, the positive neutralization tests were given mostly by serums from individuals that had completely recovered from the disease, while no neutralization occurred in those from the more severe cases.

Shaughnessy, Harmon, and Gordon (1930) also report low figures (42.9 per cent without neutralizing antibodies) in their series of fourteen recovered human cases, while Aycock and Kramer (1930) had negative results in 32.1 per cent of twenty-eight convalescent monkey serums. On the other hand, the latter workers obtained 87.9 per cent positive tests with the serums from forty-one recovered human cases.

Can one reconcile the different conflicting figures given for the tests on convalescent serum, and how should they be interpreted? Should one consider the view of Andrewes, that immunity in filtrable virus disease may be due to a constant reinforcement by repeated unrecognized infection in those constantly exposed to the given virus, or should one believe, with Aycock, that either an early subclinical infection produces a lasting immunity, or that the individual has a certain inherent ability to withstand the disease (autarcesis)? In the latter case an immunity would not necessarily be dependent upon the presence of neutralizing antibodies. If, therefore, immunity is not entirely dependent upon the production of these antiviral substances, just as in certain bacterial infections the presence of particular antibodies (opsonins, agglutinins) does not necessarily affect the course of the disease, one may perhaps correlate the hypothesis of autarcesis given by Aycock with the recent work of Jungeblut and Engle,

on the inhibitory effect of the pituitary extract upon the development of poliomyelitis in young monkeys. Immunity may thus be considered largely a function of the inherent physiological constitution, and one would not necessarily expect a high percentage to show neutralizing substances.

On the other hand, there are several other factors to be considered in regard to these low figures for the convalescent serum:

1. Second attacks of poliomyelitis are rare or almost unknown, so that undoubtedly immunity must be present in recovered cases. If this immunity is not manifested experimentally by the neutralizing ability of the patient's serum, one should not consider it to be entirely absent, but merely not present in sufficient quantity for demonstration by the technic employed. The methods in use for animal experimentation in poliomyelitis are extremely severe, so that there is a probability that many serums may have contained antiviral substances but insufficient to neutralize the potent virus. However, if such serums are used on mild human cases, the effects may be beneficial in spite of the low antibody content.

On the other hand, discouraging results will undoubtedly be obtained if they are given to the more severe cases. If the potent serums belonging to the positive group should be administered, the progress would naturally be favorable for both the mild and the severe forms of the disease.

The discrepancy in the reports on convalescent serum therapy may thus in part be explained, and, if the effect of this treatment depends on the neutralizing ability, the best results can be obtained with human serum only when it is secured from a group of known tested donors who have either recovered from the disease or are so-called "normal" individuals possessing antiviral substances in the blood stream.

2. Difference in the technic employed for the neutralization tests may also be the source of one discrepancy. In the present work, every advantage was given to the serum by using larger proportions than of virus, so that undoubtedly true neutralization took place in the positive cases.

3. Another factor may also be considered: May not the monkey strain of virus which has gone through many years of animal passage have become so adapted to the monkey host that there has developed a lessened ability to be neutralized by any but the most potent human serums? A recent report by Weyer lends support to this idea, since he has shown that immune horse serum which was highly potent against the monkey poliomyelitic virus in a dilution of 1 to 500, protected against recently isolated human virus strains only in a dilution of 1 to 20, while neutralization with human convalescent serum occurred only in the same low dilution.

In whatever light the immunity to poliomyelitis may be considered—(1) as a hyper-immunization due to repeated unrecognized infection, which may account for the high percentage of normal immune serums, (2) as due to a single sub-clinical infection, or (3) as due to the presence or absence of a certain inherent physiological condition within the host—it seems quite evident from the results of the neutralization tests in the present small series and from the figures of Shaughnessy, Harmon, and Gordon[8] that serum for treatment of human cases should be obtained from known tested donors rather than from the indiscriminate use of untested material, except perhaps in an emergency. Only in this way can the results be judged in the use of convalescent or immune poliomyelitic serum.

SUMMARY

1. It has been advocated by different workers that immunity in poliomyelitis may perhaps be due: (1) to the constant reinforcement of repeated unrecognized infections from constant exposure to the disease; (2) to an unrecognized subclinical infection, or, (3) to a certain physiological make-up of the individual. These ideas have been substantiated by the finding of antiviral substances in the blood of a large percentage of normal individuals.

2. The use of human convalescent serum has been shown of value in many incidences, but only when given early in the disease, before the onset of paralysis. The value of an early diagnosis is thus clearly shown.

3. The results of using convalescent serum therapy in experimental animals, lend support to the intramuscular method of administration, although, as in the case of human beings, there was neither 100 per cent cure for the treated animals nor 100 per cent fatality for the untreated. Residual paralysis was seldom prevented.

4. The use of a standardized serum from hyperimmune horses, goats, and sheep has been advocated, but as yet has not been given sufficient trial in the United States to judge its real efficacy.

5. Some evidence has been in favor of the use of immune goat or sheep serum in a small group of human cases in the preparalytic stage.

6. The immune sheep serum has been found effective experimentally in a dilution of 1 to 200 by

the *in vitro* neutralization test in monkeys, while animal experiments show that it has a certain therapeutic and prophylactic value. It also retains its potency for a period of at least ten months.

7. The use of human convalescent serum is rational from the experimental evidence reported, but lacks uniformity of results in practice. That this may be due to differences in the potency of each serum has been demonstrated by testing for antiviral substances in two groups of recovered cases.

8. In the group of twenty-two treated cases, only six (27.2 per cent) gave a positive neutralization test, while in the group of twenty untreated individuals, eight (40 per cent) were positive.

9. In these groups it was also found that: (1) there were more positive tests among cases showing spontaneous recovery than among those badly crippled; (2) while the treated group gave fewer positive tests than the untreated, (3) there was no real evidence for the passive transfer of antiviral substances; (4) the use of such serums in poliomyelitic therapy should not be discarded unless the *in vitro* neutralization tests are found negative.

11. Finally, it seems apparent that, if the effect of serum treatment depends on the neutralizing ability, the best results can be obtained with immune serum only when it is secured from hyperimmunized animals whose serum is standardized, or from a group of known tested donors who have either recovered from the disease or who are tested normal individuals. Although there is no uniformity of opinion as to its efficacy, yet because of the experimental evidence in its favor, the use of convalescent serum therapy should not be abandoned until something more effective has been instituted.

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THE ARIZONA STATE BOARD OF MEDICAL EXAMINERS AND THE MEDICAL PROFESSION

B. M. BERGER, M. D., Secretary
Phoenix, Ariz.

(Read before the Forty-First Annual Meeting of the Arizona State Medical Association, held at Globe, Ariz.. April 21-23. 1932.)

I wonder if it is really the custom or rule, or neither, for a secretary of the State Board of Medical Examiners to read a paper on such an occasion as this? To bring before you what I believe to be the salient points of this paper, it will be necessary now and then for me to transgress a bit upon remarks that apply to the profession, and surely not the cults, because, while we are sometimes prone to soft pedal, I am personally giving you my honest and sincere opinions minus any possible egotistical expressions. It is, therefore, essential that your patience in these seemingly indirect statements, be solicited.

It is now one year since I became Secretary of the Arizona State Board of Medical Examiners, and in that time it has been possible for me to familiarize myself with the things that concern this office and those that do not. There is correspondence from

every state in the Union and from foreign countries, having pathetic as well as humorous angles. I have seen pressure brought to bear over my head, and that of the Board, from doctors here in Arizona, so that their desires and wishes may be gratified. For the benefit of those who do not know, all moneys received at my office for examination and reciprocity, are sent to the State Treasurer. We are, like other state departments. budgeted and, therefore, can spend only so much. I should say—so little! I tell you this so that you may know how financially handicapped we are, much as we would like to correct the evils confronting, and to quite an extent affecting, you and me. One former secretary had to close his office; another had to have a special appropriation to complete essential expenses. I also had to close the office for about six weeks previous to the fiscal year beginning July 1, 1931, because of lack of funds.

For the fiscal years of July 1, 1931, and July 1, 1932, the Legislative Examiner was so generous in his economy program that he so arranged the budget that the Secretary's salary be made possible for 24 months, therefore making it impossible to close his office. In the language of the laity—I was made "the goat"; not because I am unable to close my office, but for the reason that such vast correspondence comes in that cannot be handled without a long delay, because the budget for a stenographer for the Secretary of the Board was omitted. This is the first time such an unwarranted procedure was made possible. I should like to see the profession ally themselves more closely and advocate an increase in the Board's budget. I say this, gentlemen, irrespective of the Board's membership makeup. Our budget is so worded that no unused funds may be transferred from one section to another. For example, should a few dollars be left over from traveling expenses, they cannot be used for operating expenses. This is the first time, I believe, that our budget has been so technical, whereas a lump sum was allowed in the past.

In going over the records of Arizona licentiates, I noticed in the Register the names of two doctors—now practising in Globe—among the first doctors to receive a license to practice medicine; dated May, 1903. Fee $2.00 for a license. I also noticed the name of one of the guests—Dr. William Duffield of Los Angeles, formerly a member of the first State Board of Medical Examiners.

The A. M. A. 1931 Directory lists the names of 494 doctors in Arizona and the population 435,573. My records show 453 licenses granted in the past ten years. In the past two years, 108 doctors were given licenses.

Concerning reciprocity, may I ask, "Why should Arizona reciprocate with every state in the Union when not all states reciprocate with Arizona?" The following are the names of the states which do not number Arizona among those with which they reciprocate. At least two states in the Union have no reciprocity whatsoever. May I be bold enough to wish I knew of at least three. I have no selfish motive in that remark, because I believe it would work out ever so much better for all concerned—at least for those who had no gold before they came in, and for those who are in and have none. Going back to the states that do not reciprocate, I refer to: Florida, Georgia, Illinois, Idaho, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Nevada, New Jersey, Oregon, New York, North Carolina, North Dakota, Rhode Island, South Carolina, Tennessee, Utah, Virginia, Washington, West Virginia and Wyoming.

Why the Board of Medical Examiners should meet every three months, is beyond me. I think it is twice too often. Twice a year for examinations and the consideration of reciprocity is surely sufficient.

Of vital importance is the status of osteopaths in so far as they concern the doctors of medicine. "Osteopathic physicians and surgeons" is the title given practitioners of these schools. On the coast in at least on hospital, I am told, every third patient is sent to the osteopathic ward where they, the patients, are given all forms of surgical and medical treatment. Today all Grade A medical schools demand at laest two years' pre-medical schooling before entrance. Osteopaths do not have such minimum entrance demands. The very books sold to you and me are sold to them. The very same text books used in our medical schools of today are sold to their schools. These are books written by ethical doctors, I presume. It does not behoove me to elaborate on this matter, other than if you should ask, where does this come in under the topic of this paper? my answer would be—food for thought! May I add, business is business. Osteopaths take our Board!

The annual registration of doctors of medicine is now in vogue in eighteen states, including Alaska, and has for its purpose law enforcement. It would be a great help to us. A small fee of at least one or two dollars a year would help to provide (1) enforcement of the medical practice act, (2) having available a list of the doctors licensed in our state, this list to be sent to the Law Enforcement Department.

House Bill No. 23, known as the Arizona Narcotic Control Act, and passed by the Tenth Legislature in regular session, requires that we doctors register with the State Board of Pharmacy at Phoenix, should we prescribe or deal in narcotics. In defense of the Pharmacy Board, and for your information, they, the Pharmacy Board, had nothing to do with this. I bring this before you so that you may, at your convenience, read this Bill. It is my opinion that the Federal Government should remedy its narcotic evil, and that the dollar we give toward this be used, instead, for registration.

Granting a temporary license. This is one of our bugaboos, and we stay shy of it all we can. If a doctor in a community desires to have another take his place, or if a doctor in any given area wants a doctor in his group, we get an S. O. S. request for a temporary license. The law states that a temporary license can be granted only when emergency exists. Our view and the other fellow's way of looking at it, as to just what constitutes an emergency, present just two opposite views. I think we have granted five temporary licenses in the past twelve months.

I am sorry to say that not a few regular doctors are practising medicine in Arizona without a license. It is no fault of the Board if an application for examination or reciprocity comes into my office within, instead of prior to, the two weeks before a meeting of the Board. There are ever so many irregular practitioners without a license. So if the question were asked me, what is an irregular, I could best answer that by asking, what is a regular?

Basic Science. It is the consensus of opinion of medical boards and members of medical associations that basic science laws have been of inestimable value, as they have been effective in keeping out cultists. Doctors, I am told, should not lobby for legislation during the Session. The public and legislators combined should be educated to our needs, but this requires tact, time, and diplomacy. If each medical society would appoint a committee to interest local business men and organizations in matters that concern the profession, we should accomplish more in the way of legislation.

About ten years ago, there was a gentlemen's agreement, in the matter of reciprocity, between Arizona and Sonora, Mexico. About a year ago the Mexican Federal Government definitely shut out all foreign practitioners. Under their new Federal Code no physician not registered in the Federal District could prescribe narcotics or sign death certificates; and within the past year, I understand, the Federal Department of Health of Mexico has refused the registration of foreign diplomas. From information which I believe to be reliable, these conditions have proved a hardship on our American doctors. Good legislation on this matter inserted into the Medical Practice Act would help the Board to a more definite procedure.

In conclusion, may I suggest that a questionnaire, so worded as to meet the recommendation of this Association, be sent to each candidate for the next Legislature, and the time to do that is NOW—not THEN!

Last, but not least, the Arizona State Board of Medical Examiners has for its purpose the object of determining who are and who are not eligible to practise medicine in this State, (done, as you know, by either examination or reciprocity) and to have on record the names of those who have been granted licenses. Much as we should like to, we can not correct many problems that come before this Board, because of lack of funds. I have made no attempt to offer a panacea or high pressure salesmanship for your consideration. What concerns our Board, concerns you. Fortifying our Board brings that much better results to you. The greatest saint is not the man who does extraordinary things, but the man who does ordinary things extraordinarily well.

DISCUSSION

DR. R. J. STROUD (Tempe): I want to draw your attention to two facts brought out in Dr. Berger's paper: first, that 102 doctors have been granted licenses in the past two years, and the other that five temporary licenses have been actually granted in the past twelve months.

Just what increase of population justifies granting of 102 licenses is a mystery to me, for this is over 20 per cent of the number now practising medicine. We don't die off so quickly that a 25 per cent increase is necessary. Such an admittance of so many doctors will tend to make tramps of most of the medical profession within our borders in the next ten years.

If ever a year came to Arizona when no temporary licenses should have even been applied for, let alone granted, it was this past twleve months. If, as Dr. Berger says, they side step the issuing of such temporary licenses, a good many must have been applied for. What occasion could ever arise in the face of declining populations for the issuing of a temporary license, I cannot imagine. Originally, temporary licenses were given because, during the growth of mining companies, it was hard to get a man quickly and for short periods if some one dropped out or they needed a new man. This privilege has no doubt been abused, is being abused, and will continue to be abused as long as human beings consider only things of the moment.

I think the time has come when a moratorium in Arizona should be made as to new physicians coming in. We are asked in Maricopa County to go out and get informatioin concerning cultists and irregulars who are becoming more active as time goes on, but we advertise the fact that there are not enough doctors to care for the people by adding 102 of us to our rolls in the face of a declining population.

Just so long as you accept more men in Arizona, you are going to see the younger ones take up some specialty and immediately rise above the mass of the population.. The medical profession is on trial and the sooner we know it the better. Sometimes we so closely guard our ethical parts that we forget that human beings are only human and not part of a vast machine over which we hold control. In our complacency we let things drift until the last part of the ninth inning and then pray that somebody hits a home run. Like Casey, we generally fail.

As long as Arizona is being so widely advertised to the public and also to the profession, a preponderance of professional men will choose this state to make what they fully believe will be an easier living and to live a happier life. Personally, I should like to see the number of men coming to this state limited to ten a year, with preference given to Arizona-bred boys who wish to return to their native state and whose parents are taxpayers. Then population, if it ever should increase again as rapidly as in the past, would have a chance to catch up. This is radical, but no more radical than copper mines and copper-mining towns limiting their population by closing down and putting men out of jobs. It simply has to be done in the mining industry before somebody goes broke, and it will have to be done in this medical activity—unless you want to have an impoverished medical profession. And it can be done if you men will just get together and do it. Certainly no other crowd of people is going to fight your medical battles,—and you seem reluctant to fight your own.

Up until 1905, medical schools of any and all grades turned out hordes of graduates—a great many poorly trained. This was, however, in the face of an enormous increase in population, when we welcomed any and all from other countries. Then medical schools began to advance, and the poorer ones dropped out, and a little lull took place; but now the medical schools are loaded to capacity and turning out doctors faster than any other country in the world, and that in face of an almost stationary population. We have three times as many doctors per population as Great Britain, France, or Germany, and four times as many as Sweden. But our graduates are high-toned and flock only to cities, leaving country places alone. Just why Arizona should continue to be the Mecca of this enormous number of graduates, where our medical population has increased by 25 per cent when the general population is decreasing, is hard to say. But the remedy is in your hands if you care to use it. It seems that the majority of doctors who start clinics or groups go outside of the state for their associates, who, of course, add to the general medical populace. It has come to be almost a racket. Just how these men justify themselves when complaining about the cults, is hard to see. For the public likes to have a fellow rub shoulders with him a little bit, whether he is orthodox or not. Let us just introspect a little and keep our skirts clean before we try to throw stones at the other fellow. As Dr. Berger says, "Who is a regular?" The simple question is, "Does the medical profession in Arizona desire to declare a moratorium?"

DR. C. E. YOUNT (Prescott): It seems to me that we have not been on our job in securing memberships to the State Association. We have two hundred and eighty-five members, and there are about two hundred more doctors who should belong to the State Association.

DR. W. W. WILKINSON (Phoenix): Three weeks ago Dr. Clark L. Abbott of Oakland, and a member of the California Board of Medical Examiners, said to several of us who were lunching at the Maricopa County Medical Library that the way for Arizona to get a Basic Science Bill passed was to initiate it and not depend on the State Legislature.

DR. H. P. MILLS (Phoenix): I want to ask about the possibility of starting action to handle the finances of the Board of Medical Examiners. If it is left to the legislators to prepare the budget, the apportionment will be small. If the Board can receive the fees collected, these monies will furnish sufficient funds to carry on the work of the Medical Examiners, including a salary for the Secretary, providing for a stenographer, for expenses of Board members in attending meetings, and providing sufficient funds to secure legal advice as needed.

HAY-FEVER, ASTHMA AND TUBERCULOSIS

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(Presented at the Staff Meeting of St. Mary's Hospital, Tucson, May 13, 1932.)

Literature does not abound with discussions of these subjects and their relation to each other. Physicians of the Southwest see so many of these cases that a discussion of them is always timely. As we know, the climate of southern Arizona attracts asthmatic and tuberculous patients from all over the country. Hay-fever is an important local problem for an entirely different reason. It is conservatively estimated that 10 per cent of the population of Tucson has seasonal hay-fever in some degree. There are several factors entering into the cause of this

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fact. First, the long warm season favors a long-continued growth of many wind pollinating plants. These plants begin to pollinate early in the year and some of them continue to throw off pollen until late in the winter; hence, we have many months in which the air is well filled with pollen. The dryness of the air facilitates a high pollen content of the atmosphere in two ways. First, there is little rain to wash the pollen granules out of the air; the pollen is light and buoyant and floats readily in the dry air. Second, there is often more pollen liberated by plants due to the long so-called droughts; if the plant is about to perish because of lack of water, nature makes it pollinate in an effort to perpetuate itself before the parent plant dies. On the desert there are few grasses that make attractive lawns. One has been importd which does well when sufficiently irrigated; it begins to grow in early spring and lasts until late fall. It is quite hardy, and, therefore, most of the lawns are made up of it. This grass, Bermuda, is a profuse pollinator and is pollinated by wind; furthermore, it bears pollen practically all its growing season, and, therefore, a high content of Bermuda pollen is in the air for a long time. The winds of this area also are a factor, the pollen is light and buoyant and there is no way of telling how far it may be carried by some of our winds. We do know, however, it is as much as 5,000 feet above the earth, so it may travel laterally for many miles in some of our wind storms. From the foregoing, it is apparent that there are many factors conducive to a high pollen content of our atmosphere for many months of a year. Then, given a person with any, even slight, tendency towards hypersensitiveness, with the excessive exposure to many potential offenders, he is likely to develop syymptoms before he has been in this climate many seasons.

Having established the fact that we have, in our midst, many sufferers from hay-fever, asthma, and tuberculosis, it is now pertinent to ask what, if any, relation exists among these diseases. The relation of hay-fever to asthma is too well recognized to warrant further discussion here. Suffice it to say that 35 per cent of untreated hay-fever patients develop asthma at some time in their lives.

Before entering upon this discussion let us agree on what we mean by asthma. It is a term loosely used to designate any dyspnea associated with prolonged expiration, wheezy respirations, emphysema, and so forth. This undoubtedly is a suitable definition for asthmatic breathing, but unfortunately the description fits several unrelated clinical conditions which simulate each other in the nature of their respiratory paroxysms, but are totally different in etiology and in therapeutic indications. It fails to differentiate cardiac, renal, thymic and other so-called asthmas from the more common and typical form of spasmodic dyspnea generally recognized as bronchial asthma. Coca and his co-workers have coined the term "atopy" to designate those clinical forms of hypersensitiveness in man which are hereditary in nature. In considering bronchial asthma as that form of asthma which is subject to the atopic influence, one automatically segregates it from the so-called thymic, renal, and cardiac asthmas, as well as those forms of chronic bronchitis and emphysema which symptomatically simulate bronchial asthma. Hence, we arrive at Walzer's definition: "Bronchial asthma may be defined as that form of atopic illness which manifests itself in recurrent attacks of paroxysmal dyspnea, particularly pronounced in its expiratory phase." It is to this true bronchial asthma that I refer in this discussion, unless otherwise specified. With this understanding of the meaning of asthma we are now ready to see what relation, if any, it bears to pulmonary tuberculosis.

First, how often are these two conditions found together? Schroder, among 4,716 cases of tuberculosis, found only thirty who had asthma (0.7 per cent). On the other hand, Rackemann, among 1,074 asthmatics, found thirteen cases of tuberculosis (1.2 per cent) and Kleivitz noted eight among 423 cases (1.9 per cent). Harkavy and Hebald had proved tuberculosis in forty of 400 asthmatics. In our own series of tuberculous patients admitted to the Southern Pacific Sanatorium, where theoretically only patients with tuberculosis are admitted, there have been 149 admissions; one of these had only bronchial asthma and no clinical tuberculosis; of the remaining, there have been three with bronchial asthma (2 per cent). Thus, we see that, although percentages vary, the two conditions do coexist, contrary to the once popular belief that these two conditions could not coexist, and that the presence of one precluded the presence or development of the other.

It is somewhat generally conceded that there are certain types of pulmonary tuberculosis often associated with asthmatic respirations. I refer here to the old fibrotic type, which occurs usually in elderly persons, is often of long standing, very slowly progressive, and forms scar tissue almost as rapidly as destruction of tissue occurs. It often involves considerable area of pulmonary space, and has a compensatory emphysema in uninvolved areas, especially at bases, accompanying it, and also a secondary chronic bronchitis, not infrequently. It is by virtue

of its extensive involvement, loss of elasticity of lung tissue, complicating emphysema and bronchitis, and probably some secondary myocardial changes, that a dyspnea which simulates asthmatic breathing results, but this does not fulfill our requirements as given in our definition, and it is not this syndrome that we are interested in. There has been much written about the tuberculous infection being an important etiological factor in the production of asthma; many of the writers presume that sensitivity to the protein of the tubercle bacillus is responsible for the asthma. There are no definite data to justify such an assumption. Furthermore, the enlarged hilum nodes in tuberculosis have been considered important in the causation of asthma. This not only has never been proved, but there are some observers who contend there is a definite antagonism between these two pathological processes; however, this is also without proof.

Harkavy and Hebald attempted to work out the relation between asthma and tuberculosis. They studied 400 cases of asthma and found forty cases with clinical and x-ray evidence of tuberculosis. Eighteen of these cases were studied from an allergic standpoint: they were given skin tests with various proteins and also used passive transfer of Prausnitz and Kutsner for atopic reagins in their serum. Nine of the eighteen studied were found to be hypersensitive to proteins of the inhalant group, and their asthma was relieved by removal of the offenders. The conclusion, therefore, seemed reasonably justified that foreign proteins of the inhalant group, and not the tubercle bacillus protein, were responsible for the asthma in this group. Of the remaining nine nonsensitive cases, all gave evidence of having foci of infection, six having chronic sinusitis, two bronchiectasis, one a chronic non-specific infection in lower lobe of lung. Their symptoms were no different from similar cases that had the same type of asthma and infectious bronchitis without tuberculosis; therefore, the asthma was assumed to be due to the complicating respiratory infection and not to the tubercle bacillus. From all data at hand, the consensus of opinioin is that atopic bronchial asthma may complicate or may be aggravated by pulmonary tuberculosis, but there appears to be no evidence that the tuberculosis plays any part in the production of the asthma, and there is no proved allergic manifestation in the form of bronchial asthma due to the protein of the tubercle bacillus.

Now, conversely, the question whether asthma predisposes to tuberculosis is to be considered. Our evidence to answer this question is mostly presumptive. Literature relative to asthma's being an etiological factor in tuberculosis is not profuse. The statistics previously quoted in this paper show that the two diseases are associated with each other only rarely, and this fact in itself shows that asthma plays no important role in the causation of phthisis; for, as many asthmatics as there are, if it predisposed to tuberculosis frequently, tuberculosis would be observed far more often than it is in asthmatics. Apparently, if there is any predisposition in an asthmatic to tuberculosis it is a non-specific effect in lowering general resistance so that a dormant or new tuberculous infection may become active, and the victim's resistance is so low that he is unable to overcome infection that would otherwise be conquered without the patient's being aware of its presence.

Finally, we feel that hay-fever and asthma are very definitely related and associated, and one leads to the other. Furthermore, we feel that asthma and tuberculosis are not related in any way, neither one causing, nor predisposing to, the other, and that when they are found in the same patient it is only a coincidence.

CASE REPORTS

MASONIC HOSPITAL

El Paso, Texas, April 14, 1932.

Case History; No. 13867. Coronary Obstruction Acute and Cardiac Infarct. Presented by DR. G. WERLEY, April 14, 1932.

This patient was an American male, aged 46, married, with five children living and well. He had the usual diseases of childhood. Yellow fever during the Spanish American war in Philippine Islands. Two years ago he had an attack of acute indigestion; was in bed for one week and it was six weeks before he was able to work again. History of hives ever since childhood; some on his back at the present time.

Present attack began on the fifth of March. He complained of pain in his chest, that went down both arms. He consulted a doctor immediately, going down to the doctor's office. I was called to see him. He was very pale, covered with cold sweat; his voice was feeble. He was restless, moving back and forth, trying to get easy. He was almost pulseless. Heart sounds were feeble; they could hardly be heard at the apex or any place else. He was suffering intensely and we were convinced that he had suffered a cardiac infarct. He was taken home in an ambulance. Two nurses were placed on the case at once. His temperature went up almost immediately and pulse ranged from 110 to 120, and at times from 140 to 150, respirations from twenty up to forty-five. Temperature varied from 100° to 102° and even higher at times. The pain required morphine

for relief. Patient was cyanotic and dyspneic. Liver began to swell. Heart was very much dilated and heart sounds remained very feeble, almost inaudible. He had great difficulty in breathing, so that, at the end of two days, I felt very doubtful about his recovery and the question of oxygen came up. Patient was brought to the hospital and placed in the oxygen tent. He did not get a great deal of comfort out of it at first, but after a while he seemed to get considerable comfort and called for it when it was removed. I could not see that he received any beneficial effect from the oxygen. A few days later a friction rub was heard over the heart, which became very marked and continued off and on until his death. (It did disappear for a few days but came on again three days before death.) He also developed a pleuritic rub on the left side adjacent to the heart. This pleuritic rub also continued until his death. His temperature never did go down. The heart sounds, after three or four days, became very much stronger and the liver was not so easily palpated. He never did come back as these cases generally do, and he became delirious and had involuntary movements and became quite unmanageable at times. He was given stimulants, respiratory caffeine sodium benzoate. Direct heart stimulants are not indicated in such cases. Electrocardiographs in these cases are of tremendous help and are positive in 70 to 80 per cent of these cases of infarct.

This patient left the hospital in an improved condition but died at home a few days later.

History No. 13726. Coronary Occlusion. Presented by DR. T. J. McCAMANT.

Patient is a well developed white male, aged 60. Family and past history not obtained. He was admitted to the Masonic Hospital February 3, 1932, 9:20 p. m. Expired February 3, 1932, 11:55 p. m.

Patient had been drinking and eating in an adjoining community. He had had two cocktails and a stein of beer with a heavy rich dinner which was hurriedly devoured, after which he had to rush to catch the train. He became nauseated in the taxi while going from dinner to the depot. Pain was severe, extending down both arms. He had difficulty in breathing, said he was not accustomed to drinking and gave no history of ever having had this trouble before. I was called to the station about 9 p. m. to see a patient whom the officials thought too sick to make the trip. When I arrived, I found the patient lying on a couch in a compartment. He looked sick, with ashen color, and was bathed in cold clammy perspiration. He was perfectly rational, said that he felt much better since he vomited and believed that he could make the trip. The heart sounds were distant and there appeared to be a missing ventricular contraction. I gave him 1/50 gr. of nitroglycerin and advised him not to make the trip, but to remain here and go to a hospital for the night and, if he should be able, he could resume his trip the next day. Patient consented to this and an ambulance was called by the train officials. I hastened to the Masonic Hospital to make preparations for his arrival. The bed was prepared and heat placed in it. With the aid of the ambulance driver, the floor nurse and I removed his clothing and placed him in bed with no exertion on his part. Heat was applied externally and I gave him ¼ gr. of morphine hypodermically. Respirations in a few minutes were much easier, nausea was gone, and patient stated that he felt much better. He gave me his brother's address and requested that, if anything should happen to him, his brother should be notified. Said that he had what the doctor in California told him was acute indigestion that lasted three or four hours. He complained of having a distressed feeling in the stomach and a dose of bisodol was given. A special nurse was placed on the case and I remained until he was fairly comfortable. I told the nurse to give him morphine to keep him comfortable, to see that he did not exert himself one bit, to give him his medication and liquids through a drinking tube, and to notify me if his condition changed. I was called about 11:40 p. m. and was told that my patient was in a bad way and, when I reached the hospital, he had expired.

Autopsy Findings (by Dr. George Turner):

The body is that of a man about 63 years of age. It is about 69 inches tall and weighs about 200 pounds. He was rather fat and well nourished.

The pleural, pericardial and abdominal cavities contain no excess fluid, except the pericardial cavity. This cavity contains about 10 cc. of light yellow, clear fluid. There are no pleural adhesions.

Inspection of the viscera shows the lungs to be normal. There are several ecchymotic areas over the left ventricle of the heart. The liver shows a passive congestion in that it is slightly enlarged, has a deep reddish-brown color, and its margin is rounded. The gallbladder appears normal and contains no stones. The stomach and intestine appear normal. The stomach contains about 350 cc. of partly digested food. The gastric wall and mucosa are normal. The appendix is long, slender, and fibrous from an obliterative type of fibrous infiltration. The tip is adherent to the omentum. Aside from slight anthracosis and moderate passive congestion, the lungs are normal. The left heart muscle is anemic with areas of petechial hemorrhages apparent on the surface. Both coronary arteries show advanced fibrous and calcific infiltration of their walls. This condition is more dense on the left side. At a point in the left coronary, 2 cm. from its orifice, the lumen is reduced to 2 mm. in diameter. The right coronary is occluded by a thrombus about 3 cm. from its orifice. Aside from passive congestion, the liver presents small scars here and there over its surface. These are old and not of immediate concern. Both kidneys present the same picture. They are irregular and lobulated. The capsule peels easily from each. The kidney structure is of a deep reddish-brown color. The glomerulae are prominent. Examination of the gastric contents reveals no evidence of harmful poison.

Diagnosis: Coronary occlusion.

Case Histories No. 13747 and No. 13894, presented by DR. F. P. MILLER (Dr. Liddell's Case).

Cholecystitis and cholelithiasis, first admission: (1) Partial obstruction intestinal; (2) adhesions intestinal; (3) peritonitis, second admission.

Family History: Father died at the age of 66, of yellow fever. Mother living and well, aged 67. Two brothers living and well; three sisters living and well. One sister died of influenza; one sister died of gallstones. No tuberculosis, cancer or mental diseases in the family.

Past History: Whooping cough and chickenpox as a child. Measles at 18. Mumps at 25. Eczema as a baby. Menstrual history has been normal and regular up until last September. Some irregularity since. Has been pregnant four times. Two children living and well, ages 10 and 6. First pregnancy twins, weights 10 and 7 lbs. Forceps delivery; one died at birth. Patient was ill for about a month following delivery. Severe lacerations at that time. Two miscarriages at two months, causes unknown. Patient has always been constipated, requiring laxatives almost daily. Has lost about thirteen pounds in weight the past two months.

Present Illness: Patient states that when she was 25 years of age she had "stomach trouble," i.e., she was distressed with gas, upper abdominal pain, nausea, and vomiting. These attacks usually came on after eating. This condition persisted for about four years. She was somewhat better up until a year ago when the symptoms again returned and grew in severity. About three months ago, patient began to have attacks of pain that started in her right upper abdomen just below the rbis and radiated across to the back and right shoulder blade. These attacks always came on after meals. Greasy or heavy foods are more apt to bring on the attacks. She has had several real severe attacks during the past three months, accompanied with nausea, no vomiting. No fever as far as patient knows. No jaundice noted. X-ray of gallbladder before entrance to the hospital revealed no stones. Has not required morphine for relief of pain.

A cholecystectomy was done. The galbladder was found to be distended and it was filled with medium-sized stones. Patient's postoperative condition seemed good. Maximum postoperative temperature 101.6°. Her wound drained freely. She left the hospital on the fifteenth postoperative day, apparently in good condition. Temperature 98.4°. The evening before she left the hospital, she vomited once.

A month later she returned to the hospital with the following history: Since leaving the hospital patient has had frequent attacks of vomiting, always vomiting the previous day's food. Distention of the abdomen at first present at times, but the past few days the distention has been present all the time. Enemas do not give complete relief. She complains of pain in the lower abdomen, more pronounced on the left side. She has been extremely constipated. She was sent to the hospital for observation.

X-ray of the gastro-intestinal tract: Fluoroscopic and film of abdominal area show approximately 75 per cent retention of barium in the stomach at 6 hours, with the advance column high in the upper coils of the ileum. No barium is seen in the lower coils. The duodenal cap was dilated, with some apparent adhesions at the junction of the first and second portions. These adhesions are not producing any marked obstruction. Conclusion: The failure of the barium to pass into the lower coils of the ileum would be suggestive of an incomplete or partial obstruction of the small intestine in the region of the upper coils of the ileum.

White blood count showed 9,300 white cells; large mononuclears, 4 per cent; small mononuclears 13 per cent; polymorphonuclear neutrophiles 78 uer cent; transitionals 5 per cent.

Vomiting and distention gradually increased. Patient was given glucose and soda intravenuosly twice a day. She was operated on nine days following her entrance to the hospital. Many adhesions and free fluid were encountered. The colon was adherent along the line of the old incision and around the region of the gallbladder, liver, and pyloric end of the stomach. The small intestine was also adherent in numerous places, having the appearance of plastic peritonitis more or less confined to the upper part of the jejunum and duodenum. Another adhesion was encountered, of the peritoneum and jejunum, on the left side opposite the anterior superior spine of the ileum. Large amount of fluid was encountered in both the greater and lesser peritoneal sacs. The adhesions were separated and a gastro-enterostomy was done. Patient's condition following operation was serious. Patient expired thirteen hours after her operation.

CASE OF ABDOMINAL PAIN
(Diagnostic Discussions)

W. WARNER WATKINS, M. D.
HOWELL RANDOLPH, M. D.
D. R. GASKINS, M. D.
ORVILLE H. BROWN, M. D.
J. D. HAMER, M. D.
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Phoenix, Arizona

(Case No. 12051, Case Records of Massachusetts General Hospital, from Boston M. & S. Jour., Feb. 4, 1926, page 207.)

Case Record

An American carpenter seventy-five years old entered November 12 complaining of pain in the abdomen and the small of the back. He had always been subject to sick headaches. For eight years he had lived alone and cooked his own meals. For some years he had had a moderate degree of constipation. Recently he had urinated at night. He had worked at his trade until a slack season, five months before admission.

Since the middle of the summer he had been losing appetite and weight. August 19 he got up and fell unconscious. After this he had almost continuous pain in the stomach. He often felt as if vomiting would relieve this, but could not vomit. He lost appetite until he could hardly force himself to eat. Nine days before admission he vomited a little bitter yellow fluid. A week before admission he began to have some pain in the small of the back, more on the right, and three days before admission pain in the chest with cough and blood-streaked sputum. He weighed 145 pounds the middle of August, 120 the middle of September, when he "gave up." During the illness the urine had been scanty, but there had been no pain or burning.

Examination showed an emaciated, dehydrated old man, acutely ill, with flushed cheeks and foul breath. Mentally he was somewhat irresponsible. The sclerae were icetric. The teeth were broken and decayed roots. There was marked pyorrhea. The gums were spongy and bled easily. The tongue was dry and furred. There was a hard firm supraclavicular gland measuring two cm. The lungs showed dullness at both bases and in the right axilla and patchy dullness under the left scapula. The lower portions of both lungs were filled with moist sticky and crepitant rales, heard also in both lower axillae. There were diminished voice and breath sounds at the right base. The heart sounds were faint. The action was rapid. Electrocardiogram showed sino-auricular tachycardia, rate 125. The blood pressure was 135/75. The arteries were palpable and tortuous. In the epigastrium just above the umbilicus was a hard firm irregular mass 9 cm. in diameter. There was slight epigastric spasm. In the right flank and costovertebral angle was a soft mass with marked tenderness. The liver seemed to be enlarged, but the edge could not be felt, as the mass masked the middle lobe. The testes were large, not tender. The epididymis felt nodulra. The rest of the examination, including the rectal examination, was negative.

The temperature was normal, with a rise to 102.5° the day before death. The pulse was 108-140, with a terminal rise to 180. The respiration was not remarkable. The urine was dark or dark red at all of three examinations, the slightest possible trace of albumin at two, questionable at the third, bile at the first, a few to a moderate number of leukocytes at all, a few to rare red blood corpuscles at two. The blood showed 14,750 to 26,840 leukocytes, 84 to 86 per cent polynuclears, reds normal except for some rouleau formation in one of two smears; platelets slightly reduced in numbers. A Wassermann was negative. The non-protein nitrogen was 47 mgm. per 100 c.c. The stools were clay colored at all of three examinations, guaiac positive at all; no macroscopic blood; fats present once. X-ray showed rather coarse diffuse mottling throughout both lungs, rather more marked at the right base. The examination was unsatisfactory on account of motion.

The orders were for bed with low head rest, forced fluids, liquid diet with one or two ounces of whiskey daily, morphia gr. 1/6 s.c. daily. November 14 digifolin gr. vi was given intramuscularly, and an order for digitalis gr. iss t.i.d.

The patient showed marked improvement as to dehydration, but otherwise failed gradually from admission. The second night he was somewhat delirious. Early in the morning November 17 he died.

W. Warner Watkins, M. D.

It is one of Cabot's maxims, probably repeated in his discussion of this case, that when confronted with the death of a man over seventy years of age, the cause of death will fall in one of four groups in ninety per cent of the cases:

1. Cardio-vascular crises, including arteriosclerotic lesions of brain and kidney, coronary disease and angina.
2. Malignancy.
3. Urinary infections from prostate disease.
4. Terminal infections, such as pneumonia and sepsis.

While he had an arteriosclerosis, with evidences referable to heart, kidneys and brain, the symptoms were slight and we have no good support for a diagnosis of death from vascular lesion.

For urinary infection from prostatic disease we have no good evidence. Rectal examination of the prostate was negative, and while he had urinary frequency and some abnormal findings in the urine, they are better explained by arteriosclerotic nephritis, not sufficient to cause death, than by local lesions in the prostate. In passing up prostatic cancer, we do not forget that the primary lesion in the prostate may be very small and insignificant, and the patient die from metastases to liver and lungs.

For terminal infection we have some support; pain in the back, physical signs of lung lesions, cough, bloody sputum, x-ray shadows, dyspnea, leukocytosis. Although the general picture suggests infection, we are told the temperature was normal and respirations not increased; pulse was fast but there was a sino-auricular tachycardia.

The evidence is better for malignancy than anything else. Loss of weight, strength and appetite, pain in stomach, nausea, tumor in upper abdomen, clay colored stools, positive guaiac test. We think an x-ray examination of the stomach would have shown malignancy, and make diagnosis of cancer in upper abdomen, preferably primary in the pylorus, with metastases to liver and lower right lung, complicated in the last few days of life by a diffuse broncho-pneumonia.

Howell Randolph, M. D.

There are a number of possible findings in this case which, when not mentioned, we assume were negative, and turn to the outstanding definite finding of a large rounded mass in the epigastrium, just above the umbilicus and a soft mass in the right upper quadrant. Because they say it was a soft mass I feel much less sure that it actually is a mass than in the case of the definite one above the

umbilicus. There was no subsequent mention of this mass in the progress notes, and no operation was done so we must either assume that the case was considered inoperable because of its advanced stage, or that they did not find the mass on subsequent examinations. Assuming that there was a mass it is strange that some surgeon did not allow his curiosity to corroborate his judgment and take a look at the mass. I am saying that there was a malignant tumor mass in the most difficult position in the entire abdomen to make a differential diagnosis. Tumor of the stomach, colon, liver, spleen, or pancreas, of very considerable size, might not be differentiated without more definite localizing signs than we have here. Without more vomiting, there cannot be much obstruction to the G. I. tract. In the absence of febrile reaction an inflammatory mass is unlikely, in spite of the marked leukocytosis. Phagophobia probably accounts for the loss of weight together with toxic action of the malignancy. Cancer of liver, colon, or stomach could, any one of them, be responsible for the abdominal findings. Because of the evidence of metastasis to the lungs, rales, and diffuse mottling, and the supraclavicular lymph node measuring two centimeters, I think we can eliminate carcinoma of the colon as it rarely metastasizes. Because the hard mass is slightly more central and distal than the liver, I believe we have a primary carcinoma of the stomach probably metastasizing to liver as well as lungs.

Sino-auricular tachycardia means simply tachycardia controlled by the normal pace maker of the heart, the sino-auricular node. There is no evidence of cardiac disease other than thickening and tortuosity of the arteries and faint heart sounds. These two findings in the absence of any other signs can very well be taken to mean a long standing hypertensive heart case in whom the heart is failing, in which case the blood pressure might not be elevated at the time of examination. Blood cells in the urine might be of more significance if there had been a history of hematuria, but I take it to mean only arteriosclerotic kidneys.

Diagnosis: Malignancy. Carcinoma of the liver and stomach probably primary in the stomach but involving the liver to an extent that the bile ducts are obstructed, causing a cholangeitis. Arteriosclerosis. Terminal bronchopneumonia.

D. R. Gaskins, M. D.

As this man presents himself we are confronted with a past history of sick headaches and a slight degree of constipation for the past number of years. The most predominant symptoms of which he complains at this time is pain in the stomach and loss of appetite with a duration of a few months. He has lost considerable weight but he also states that he has eaten practically nothing during this time. With this marked loss of weight and at this man's age we at once think of a malignancy, but his blood picture is rather against this. His leukocytosis and sepsis suggest a pathology with a formation of pus which has a reflex stomach syndrome. With his past history of constipation, headache and his present history of pain in his stomach and clay-colored stools, I am looking to the gall-bladder for a diagnosis. Statistics taken from the postmortem records of American and European hospitals indicate that from 3 to 10 per cent of all patients have gallstones. Suppurative inflammation of the bile-ducts is usually a sequel of cholelithiasis or obstruction of the ducts by tumors, damage to the biliary tract and stagnation of bile, favoring pyogenic infection. Occasionally, the disease follows a general infectious process, such as pneumonia, influenza or typhoid fever.

The most constant phenomena are a smooth uniform enlargement of the liver increasing as the disease progresses, and the usual phenomena of septic infection, fever, chills, sweats, leukocytosis and rapid loss of flesh and strength. Jaundice is usually present and may be marked, but it often depends more on the antecedent disease than on the cholangeitis itself. Pain in the hepatic region, variable in degree, is observed in the majority of cases.

Diagnosis: Suppurative cholangeitis with infarcts of the lungs.

Orville H. Brown, M. D.

A male, 75, with outstanding symptom of pain in abdomen and later in chest, with cough and bloody sputum, and the salient examination findings of mass in abdomen, enlarged liver, enlarged cervical node, diffuse mottling throughout lungs, cerebral disturbance, must have malignancy of abdominal viscera and metastases to liver, lungs, lymph nodes and probably brain.

The epigastric mass would seem to be primary. This conclusion need not be correct. We have in the hospital a case with a mass similar to that described in this case. An exploration revealed metastases throughout the retro-peritoneal lymph nodes. Hence the primary growth may have been at another place, for example, in the prostate. The rectal examination was negative. The nodular epididymis does not cause me to think of it as the source. Pain was also in the right small of the back, where a soft mass with marked tenderness existed. The epigastric mass, hard and nodular, is strongly suggestive of malignancy. The lateral mass was neither hard nor nodular; therefore, the suggestion is that it was cystic. It was extremely tender; this indicates inflammation. The chronology of events were: He had long suffered from sick headaches. This was probably in no way connected with his acute illness. Sick headaches, I believe, are a type of food sensitization. His chronic constipation is probably of no significance. He lost more than 25 pounds in five months. August 19, he fell unconscious. This may mean nothing more than weakness or pain, or both; after this he had ever present epigastric pain, nausea and loss of appetite. Nov. 5, he developed pain in the small of the back, chiefly right. Nov. 9, he developed chest pain, blood streak-

ed sputum and cough. The location of epigastric growth suggests a cancer of the duodenum or of the head of the pancreas. History does not suggest duodenal ulcer. The pain since Aug. 19 may indicate pancreatic disturbance. Absent bile in three stool examinations proves biliary duct blockage. The sclerae were icteric. This might occur in either a duodenal or head-of-pancreas cancer. Pancreatic cancer grows into the biliary ducts and also into the pancreas ducts. The dammed up pancreatic secretion would cause a cyst of pancreatic fluid and rupture of the pancreatic capsule. The mass in the right side was probably a pancreatic fluid cyst in the region of the right kidney. Some of the fluid probably burrowed also toward the left kidney.

The mental condition of the patient may have been due to brain metastases or to his advanced grade of arteriosclerosis, toxemia and suffering.

Diagnosis: Cancer of head of pancreas with growth into pancreatic and biliary ducts. Pancreatic fluid cyst. Burrowing of pancreatic fluid retroperitoneally to right and left. Right peri-renal pancreatic fluid cyst. Metastases of cancer to liver, lungs and lymph nodes and perhaps brain. Arteriosclerosis. Poor condition of teeth and pyorrhea.

J. D. Hamer, M. D.

A man of this age, with the history and findings as given in this case, and running a down hill course in the length of time that he did, is very likely to have malignancy, and the question in my mind is to try and locate the primary source of his trouble. Assuming that the tumor mass in the epigastrium is a malignancy, is it in the stomach, the bowel, the biliary system or the pancreas primarily? I do not believe that the mass is primarily associated with the common duct, the bile ducts or the liver, for we have not sufficient evidence so far as symptoms go, to attach the mass to these organs. The patient should be more deeply jaundiced, and unless it was connected to the common duct, the liver should be more easily palpated, perhaps nodular. If the mass was in the common duct, we would expect a distended gall-bladder and deep jaundice.

The patient had symptoms of indigestion. He could get any and all of his symptoms from any of the above mentioned localities for tumor formation. However, two symptoms in support of stomach cancer are lacking, and that is emesis (especially with cancer of the pylorus), and hematemesis. I do not believe that the mass was primarily in the duodeneum. They are too rare in this locality primarily, although the duodenum may be involved secondarily, especially from pancreatic malignancy. Cancer in and about the ampulla of Vater does occur, and in the pancreas, in such a way as to produce an obstructive jaundice. Ascites and edema of the lower extremities are likely to occur in biliary malignancy, and in gastric tumor with metastasis to the liver. The fatty stools as found on one examination would be in favor of pancreas disease.

From the location of the tumor mass, and absence of sufficient findings to attach this mass to the stomach, duodenum or biliary system, I believe this was a cancer of the pancreas, the location of which was in such position that it did not completely occlude the distal extremities of the ducts and the ampulla of Vater to cause complete biliary obstruction. Such location for a tumor mass is possible.

I do not believe the epididymis was the seat of the tumor mass primarily. If it were, we would expect metastasis to the liver, and not stomach or pancreas, and I can't feel that in this case we are dealing with liver carcinoma, at least to any degree of severity. However, if this is a malignancy of the pancreas, and as such, death resulted, we would expect to find metastases. Most of them do metastasize. So, for that reason, there are probably metastatic nodules in the lungs, in the adjacent lymph structures, and since there is no other explanation for the pain in the back, I will assume that he has metastases into the spine also. There is also, in the lungs, passive congestion, and probably, with the terminal rise in temperature, a hypostatic pneumonia, metastatic growth in the supraclavicular gland, atheroma of the blood vessels, pyorrhea and dental caries.

H. D. Ketcherside, M. D.

In a man 75 years of age a mass in the abdomen is very strong evidence of malignancy and when to this you add loss of weight and failing strength over a period of five months, with painless jaundice, clay colored stools and digestive disturbances, the evidence is almost conclusive.

One week before admission he began to have pain in his back and three days before admission he began to have pain in the chest, cough and blood streaked sputum. On admission the lower portions of both lungs were filled with moist sticky and crepitant rales. The x-ray showed rather coarse diffuse mottling throughout both lungs. Is this the picture of metastatic malignancy of the lungs? No, you would expect a diffuse infiltration with effusion in the pleura, but not so much moisture in the lungs. Further, he only lived eight days after the onset of these symptoms, which is rather rapid for death from metastatic malignancy. He may have had metastases in the lungs but I believe his death was due to bronchopneumonia.

If he had a malignancy, where was the primary growth? Our first thought would be the stomach, since a hard nodular growth was found in the epigastrium just above the umbilicus and he gave a history of gastric disturbance, nausea. He evidently had metastases to the liver since the liver was enlarged and he had jaundice, with clay colored stools. Gastric carcinoma metastasizes early to the liver. But how are we going to account for the mass in the right flank and costovertebral angle. From the location I believe this must have been an enlarged kidney. If the mass is an enlarged kidney due to pyonephrosis or hydronephrosis, we would expect more urinary symptoms than this case presented. Metastases in the kidney from a gastric carcinoma are, I believe, rather rare. This man died

before any gastric or kidney examination could be made, so that any statement about the origin of the growth will be a guess, but I am going to state that I believe the growth was a hypernephroma with metastases to liver, mesenteric glands, and possibly the lungs and heart, with death from bronchopneumonia.

Summary of Discussion by Dr. Cabot

The dehydration which is commented on in the beginning and at the end seems to me to have some bearing on the diagnosis. We get that drying out very much in cancer of the pylorus. We get it nearly as much in cancer of the pancreas with jaundice coming from that, but I do not remember having seen it in miliary tuberculosis. The natural snap diagnosis of anybody here would be cancer of the stomach with metastases to the liver and lungs. I think the main thing is to see what reasons there are for doubting that natural snap diagnosis.

In the first place, taking the suggestions of the x-ray plate, can it be miliary tuberculosis? He has normal temperature for four days. That is in my experience very rare with miliary tuberculosis. He is seventy-five years old, and has had nothing that I can think of in his history or physical examination that indicates a focus from which a miliary process could have started. He begins with well marked gastro-intestinal symptoms and not with fever, which would not be according to my memory of miliary tuberculosis. I think we can exclude it, and if it is excluded I do not know anything else to say of those lung fields except small multiple metastases of malignant disease.

Now as to the site of the primary process it seems to me all the indications we have point to the stomach, but we have neither any chemistry nor any x-ray of the stomach. Probably quite rightly those were not attempted. Where else could it be? Of course it is always possible to have a cancer start in the omentum. That generally gives us a mass and a pretty early ascites but not so much gastric disturbance. If his cancer was primary in the bile ducts or the gall-bladder again I should say the position of the mass felt would not be at all characteristic, the stomach symptoms should not be so notable and he should not have so much dehydration.

I do not think I can make any other diagnosis. Of course there are a great many facts that we have not got, but on the facts we have, I think the most natural supposition is a cancer of the pylorus.

Anatomical Discussion by Dr. Richardson

The case was one of carcinoma of the pancreas with very unusual metastases.

The appendix presented as a columnar mass 7 cm. long by 8 mm. by 7 mm. The thickened wall was markedly infiltrated with carcinoma cells. Extending up from the appendix, which presented a rough, fibrous-like network on its surface, there was a chain of glands running up into the mesentery. Along the aorta, about the head of the pancreas and out along the body and tail there were large columns of markedly enlarged retroperitoneal glands. They were all infiltrated with new growth tissue—carcinoma.

The gall-bladder was considerably distended, the bile-ducts a little dilated above the head of the pancreas, but in the region of the pancreas rather small. The head of the pancreas, which was somewhat enlarged and showed areas of new growth tissue, was also surrounded by masses of enlarged glands. The glands and the head of the pancreas pressed upon the common bile duct to some extent. Presumably that is what gave him whatever icterus he had. At the time of necropsy I could make out no definite icterus.

The esophagus, stomach, and intestines were frankly negative. In addition to this invasion of the appendix there were along the coils of the small intestine at the mesenteric insertion small masses of new growth tissue. In the liver there were several very small masses of new growth tissue. In the adrenal on each side there was a small mass of new growth tissue. The lumbar vertebrae showed soft grayish areas which turned out to be carcinoma.

The lungs presented an unusual picture. The bronchial glands were involved, as were the glands running up along the trachea. On the left side a prolongation of these carcinomatous glands extended upward to just above the clavicle.

There was quite a hydrothorax on the right, 1000 cubic centimeters, only a few cubic centimeters on the left, of thin brownish fairly clear fluid. The pleura showed a very fine roughish network running all over it which in places fused into small nodes. On section this network extended down into the lung tissue and could be traced for varying distances. In places the network strands fused into nodes and streaks and small areas—a network then of carcinosis.

The heart and circulatory apparatus was out of the picture. There was not much arteriosclerosis.

The head was not examined.

PUBLIC HEALTH NOTES

J. ROSSLYN EARP, Dr. P. H.
Director New Mexico State Bureau of Public Health

THE HEMOLYTIC STREPTOCOCCI

Since the Dicks by their persistence in painstaking experiment demonstrated the part played by hemolytic streptococci in scarlet fever, the importance of this organism has become more and more obvious to bacteriologists and epidemiologists alike. That the same organism may cause a simple sore throat, a tonsillitis or a frank scarlet fever is a fact that must give all health officers furiously to think. Another streptococcal disease, erysipelas, has been shown to

increase in frequency when scarlet fever is epidemic. That the same germ may be recovered from a case of puerperal septicemia and occasionally also from a sore finger should be a source of alarm to obstetricians and general practitioners as well. The possibility that a deadly menace to the parturient woman may lurk in the throats of her apparently healthy and certianly well scrubbed attendants is a possibility that was not present to the mind of Semmelweis nor even to that of his modern disciple, Paul de Kruif!

There seems to be an argument for making throat cultures as routinely in all sore throats as in cases of suspected diphtheria. But here we encounter a difficulty. For while the hemolytic streptococcus is found very frequently in cases of sore throat, tonsillitis and scarlet fever, it is also found quite often in apparently normal throats. Breithaupt[1] who found it in the throats of 50 out of 68 scarlet fever patients also found it in the throats of 25 out of 100 normal controls. We are hardly in a position to keep one quarter of the population permanently in quarantine as carriers!

Practical measures of control will probably have to wait upon progress in the typing of different strains of the hemolytic streptococcus. The present state of research in this field was most interestingly reported by Allison and Gunn[2] to the Royal Society of Medicine early this year. The majority of cases of scarlet fever have been assigned to four distinct types of which type 2 has been found only in England although strains have been examined from the continent as well as in this country. Gunn's correlation of serological types with clinical findings is so suggestive as to deserve quotation:

Type 2 infections were the most severe and included nearly all the cases of nephritis, rheumatism and endocarditis; Type 1 cases displayed considerable variability in degree of rash and severity of initial attack, but a high incidence of local complications such as adenitis, otitis and mastoiditis; Type 3 infections were of moderate severity and represented fairly closely the moderate or mild type of scarlet fever prevalent within recent years, while Type 4 infections were invariably mild, never causing any complications, local or constitutional. When complications did occur in association with Type 4 infections, evidence of reinfection by a more highly toxigenic strain was found in every case in the throat or nose and in the local lesion, e.g., otitis. Considerable diversity was observed, as might be expected, in the unclassified group, both in respect of the character of the initial attack and of the occurrence of complications, but, as a rule, those strains were associated with mild clinical forms of the disease. The same close relation between serological type and severity of associated infection was observed in three separate series of scarlet fever cases examined during the period of seasonal prevalence in three successive years.

In this work one does discern a possibility that a time may be coming when epidemiological control of the streptococcus may be placed on the same basis as is our present control of the Klebs-Loeffler bacillus.

Those who wish to take a part in this research will be interested in the description by Scharlau[3] of new medium, consisting of nutrient agar with the addition of 10 per cent sheep's blood, for the cultivation of the diphtheria bacillus. The use of this medium, though it is recommended chiefly for its efficiency in the diagnosis of diphtheria, does simultaneously reveal the presence of hemolytic srteptococci in the specimen.

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PACIFIC RAILWAY SURGEONS MEETING

The Pacific Railway Surgeons are to hold their annual meeting in El Paso on Friday and Saturday, October 7 and 8, 1932. Their meetings are always well attended and they always have a very high class program.

In cooperation with them the El Paso County Medical Society will hold their annual two days clinic.

The tentative arrangement is—the Railway Surgeons will be on the program for Friday and Saturday afternoons and the El Paso County Medical Society clinics will be on the program Friday and Saturday forenoons.

This will be the first annual meeting of the El Paso County Medical Society Clinic, which is to be held each year, but not necessarily in the Fall.

It is not necessary to be a Railway Surgeon in order to attend these meetings and clinics, as all the medical profession of the Southwest are cordially invited.

While the local program is not entirely completed, probabilities are there will be a dinner Friday evening.

It is the hopes of the Railway Surgeons Society as well as the El Paso County Medical Society that everyone will keep these meetings in mind and make arrangements to attend.

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THE PROPOSED CHIROPRACTIC ACT

A determined effort will be made by the chiropractors of Arizona and their misguided and misinformed friends, backed by a powerful national organization with plenty of funds and no scruples, to place this cult in an impregnable position in this state, where they cannot be molested by legislative enactments, and from which position they can make further attacks upon the medical profession and work their will with the gullible public.

It has long been known that the chiropractors all over the land intend to seek the privilege, by legislative act or initiated measures, to practice medicine, surgery and obstetrics, to enter hospitals, to demand that Industrial Commissions accept their work and pay their fees. In short they intend to become doctors by proclamation instead of preparation. Arizona is one of the states on which they are concentrating this year. They will succeed unless the medical profession of the state can inform the intelligent voting public what it is all about.

We print below an analysis of the proposed initiative measure, this analysis having been made for the Public Welfare Committee of the Maricopa County Medical Society:

There have been filed with the Secretary of State petitions with a total of 13,611 signatures initiating a measure governing the practice of chiropractic in the State of Arizona, and amending Sections 2533-2540 of the Revised Code of Arizona, 1928, which is the present law governing the same subject. We believe that the writer of this letter orally stated that he understood that the proposed measure was a constitutional amendment. He made that statement from a newspaper report and before our Mr. Howe had examined the records of the Secretary of State and prepared and filed the negative argument. It is an initiative measure to amend the present statute concerning chiropractic and is not a constitutional amendment. However, being an initiative measure to be voted upon by the people at the coming general election, if carried by a majority vote at such election it could never be changed by legislative action, but such change can only be effected by another initiative measure carried by a majority vote of the people at another general election. Therefore, insofar as its flexibility is concerned, it would practically perpetuate the Chiropractors in their profession under the regulations named in the proposed measure. For such reason we deem it a dangerous law, and it should be defeated at the election. The regulation of all professions should be flexible and subject to change by legislative action and that is particularly true of the healing art, which is rapidly progressing and subject to frequent changes in regulation.

The proposed measure changes the present law in several respects, which we will briefly set forth:

1. The present law does not expressly define Chiropractic except by providing: "The licensee may adjust by hand any articulations of the spinal column." The proposed law provides that the licensee may practice chiropractic defined as a system of treatment that employs palpation, nerve tracing, analysis, and adjustment of any displaced vertebrae in the spinal column and of any other abnormalties and which teaches that abnormal health is caused by the interference with nerve energy and health is restored by locating and removing any interference with the transmission of nerve energy. It is quite difficult for us to determine whether the proposed definition enlarges the scope of the Chiropractors' operations and a medical man can determine that better than we. In our mind there is no doubt that the Chiropractors, with this measure, propose to enlarge their operations under their licenses, because quite pointedly there is omitted from the pro-

posed measure the following clause contained in the present law:

"The licensee may adjust by hand any articulations of the spinal column, *but may not prescribe or administer any medicine or drug, practice major or minor surgery, obstetrics, or any other branch of medicine, nor practice osteopathy.*"

2. The proposed measure contains a clause providing that the Chiropractor shall have access to practice chiropractic in any hospital supported in whole or in part by public funds, which is not contained in our present law.

3. The proposed law provides that the Chiropractor shall be subject to all regulations relating to public health and sanitation, *and shall be qualified to sign death certificates and all other certificates pertaining to public health and sanitation.* Such provision is not in our present law.

4. The proposed measure provides that $5.00 out of each license fee shall be paid over to the Arizona State Chiropractic Association for educational purposes. We doubt the constitutionality of this last provision.

In our opinion, this proposed measure is intended first to enlarge the scope of the operations of the Chiropractor and grant him privileges which he does not now have, and second, and the more serious objection, it would entitle him to practice under the regulations set forth in the proposed bill and not subject to future change by the Legislature of the State of Arizona.

MEPHITIC OR JUST PLAIN DUMB

"Whereas it appears that an impression exists in the minds of many members of this Association that certain members have been instrumental in encouraging certain attorneys to file suit for malpractice against our members whether purposely or unconsciously, thereby causing the Association increased expense and trouble, now, therfeore, be it resolved, that the Medical Defense Committee shall have authority to require attendance to its meetings of all concerned in future suits for the purpose of determining the ethical attitude toward the cause in question."

The Council of the Arizona State Medical Association, at the Globe meeting last April, thought it expedient to adopt this resolution and broadcast the sentiment therein expressed to the constituent members of the Association. Certainly it is a very cautious and mild expression of an indignation which we know the members of the Medical Defense Committee feel about some of the cases they have been compelled to handle.

A physician who is consulted by a new patient and knowingly encourages him to bring suit aganist his former medical advisor does this out of a malicious desire to injure his fellow practitioner, or else he has that peculiar atrophy of thinking power which our high school students so expressively characterize as "dumb." We think that few doctors are so mephitic in their moral perception that they are consciously guilty of this—but there are a few. No organization can accumulate three hundred members without getting a few sour ones. Most of this trouble, however, arises from the unconscious blackening applied to another's reputation when we strain to establish our own in the new patient's mind. "Yes, I could have done something with that injury, if the job had not been bungled before I saw it." Perhaps not so bluntly stated, but leaving just that impression in the mind of the hearer. In ninety times out of a hundred the statement has not the merit of being true, and out of just such falsehoods or half-truths most of our malpractice suits arise. No malpractice suit in Arizona will ever get into court until SOME doctor gives SOME patient this false idea.

COMMERCIALISM VERSUS PROFESSIONALISM

Under this somewhat ambiguous title the Texas State Journal of Medicine of February, 1932, discusses a matter which should interest all doctors who desire honesty and square dealing from all those to whom they must look for the manufacture and dispensing of the drugs they must use to treat their sick patients. Quoting from the editorial in the Texas journal:

We do not know whether this title is fairly descriptive of the idea we are endeavoring to express here. Our observation is that for many years the profession of Pharmacy has experienced much travail in its effort to remain a profession. Its necessarily close association with the commercial enterprise known as "the drug store," or "the pharmacy," or what not, principally the first named, has presented complications difficult if not impossible to overcome. What has happened is familiar to most of our readers. That is another story.

Some years ago, manufacturers of pharmaceuticals stumbled into this same bog-hole, from which it has been partially excavated by the medical profession, through the Council on Pharmacy and Chemistry of the American Medical Association. That is also another story, and an interesting one.

Another phase of the general problem has just come to our attention. quite accidentally. One of the large manufacturers of a product extensively prescribed by practicing physicians. and extensively used for that reason, was, it seems, told by the representative of a powerful drug chain organization that it must make certain concessions to "modern merchandizing methods," or else—. The first thing wanted was an extra discount. This was needed in

order that the products in question might be advertised to the public. The advertising was deemed necessary in the interest of both the manufacturer and the chain organization which proposed to handle the products in question. The answer of the manufacturer was that he did not desire to advertise his products to the public. He prided himself that he advertised only to the medical profession. He felt that the public had no business prescribing for itself. even such a good product as he made.

The retailer urged that goods such as those in question could be sold in larger quantities by displaying them in windows, advertising them in newspapers, and by the recommendation of clerks. The manufacutrer did not want any of those procedures followed. His products were marketed only upon the prescriptions of physicians, for which reason the container did not even carry dosage directions. It was felt that the patients must get the necessary instructions from the physicians. The retailer urged that the manufacturer was hiding his candle under a bushel; that doctors were stupid, and do not know as much about the real value of the products in question as the clerks in the stores could be made to know; that the patients now make inquiries of these same clerks for advice in such matters. The retailers promised that if formulas and information were placed in the hands of clerks, and the suggested advertising methods followed, the goods in question would sell as they never had sold before.

The manufacturer refused to accede, and the chain-store concern threatened to break the manufacturer and, we are told, an effort is being made to make good the threat. An edict has gone to all clerks to dispense the product of another manufacturer. In none of this large number of drug stores may the product of this manufacturer be had except definitely named in the prescription of a physician.

This article refers to Mead-Johnson & Company. This firm is ethical in every way. They do not advertise to the laity and there is no direction nor feeding chart on their packages. They tell the purchasers to ask the physician for the proper feeding directions for their children. Their motto is "We Are Keeping the Faith." They are doing this with the medical profession and the least we can do is to reciprocate. If the doctors want this sort of cooperation, it must be mutual. A one-sided cooperation will not last.

HARRY W. SQUIBB

The medical profession of Graham County and of the state of Arizona are profoundly grieved at the untimely death of Dr. Harry W. Squibb of Safford, who died during the first week of August, following an acute illness. Dr. Squibb was a well known figure at medical gatherings, as well as in the community life of his county.

He was born in 1888, taking his medical degree from Washington University in 1915, practicing in that state for several years. He came to Arizona in 1925 and with Dr. James Morris organized the Morris-Squibb Hospital at Safford. He was a regular attendant at the state and southwestern medical gatherings, helped to organize the Graham County Medical Society and served it in several official capacities. He was the type of practitioner whom we can ill afford to spare from our circles, and his passing is deeply mourned by us.

BASCOM FRANKLIN MORRIS

The Pima County Medical Society and the Arizona State Medical Association have lost a valuable member in the death of Dr. Bascom F. Morris of Tucson who died early in June of pneumonia.

Dr. Morris was forty-four years of age, a graduate of the Vanderbilt University School of Medicine, Knoxville, Tennessee, class of 1910. He came to Arizona in 1915, locating in Tucson where he had practiced his specialty of eye, ear, nose and throat since that time. Prominent in the circles of his county society, he was a member of the Arizona State Medical Association, the American Medical Association, a fellow of the American College of Surgeons, in service during the World War, on the staffs of the Southern Methodist Hospital and St. Mary's Hospital, of Tucson.

THE BASIC SCIENCE BILL

There is printed in this issue the text of the Basic Science Bill which the Public Welfare Committee of the Arizona State Medical Association intends to introduce in the forthcoming legislature, provided the initiated measure being fostered by the chiropractors fails to pass in the general election. Should that initiated measure pass, it will be useless for the Basic Science Bill, or any other measure designed to protect the public from exploitation by healing cults or poorly prepared practitioners of any sort, to be proposed.

NATIONAL TUBERCULOSIS ASSOCIATION MEETING AT COLORADO SPRINGS

The Twenty Eighth Annual Meeting of the National Tuberculosis Association, which met in Colorado Springs the first week in June, attracted a number of men from Arizona and New Mexico. Drs. John W. and Robert Flinn presented a paper o

Heliotherapy in the Scientific Section. Dr. E. A. Gatterdam had an exhibit on Atelectasis in the x-ray exhibit. Dr. Leroy Peters was made a member of the Executive Committee of the Association and also was elected vice-president of the American Sanatorium Association. The Clinical and Pathological sections of this Association is the outstanding meeting of tuberculosis specialists.

ARIZONA BOARD OF MEDICAL EXAMINERS

At the July meeting of this Board, licenses were granted to eight applicants, as follows:

CLARK LORENZO ABBOTT, Oakland, Calif., graduate of Rush Medical College (1900), licensed by reciprocity.

HAROLD WILLIS KOHL, Tucson, Ariz., graduate of University of Minnesota (1925), licensed by reciprocity.

ROY CHESTER WARREN, Clifton, Ariz., graduate of University of Oklahoma (1928), licensed by reciprocity.

ROBERT M. MATTS, Good Samaritan Hospital, Phoenix, Ariz., graduate of Northwestern University (1931), by examination.

LAWRENCE T. BROWNING, Phoenix, Ariz., graduate of University of Louisville (1926), by examination.

MARGUERITE S. WILLIAMS, Loma Linda, Calif., graduate of College of Medical Evangelists (1932), by examination.

ROBERT ALAN HICKS, Tucson, Ariz., graduate of University of Michigan (1930), by examination.

EDITH E. NORMAN, Lois Grunow Memorial, Phoenix, Ariz., graduate of Rush Medical College (1927), by examination.

B. M. BERGER, M. D., Secretary.

JOHNS HOPKINS BONE PATHOLOGY AND RADIOLOGICAL CONFERENCE

One of the most interesting and highly educational meetings to be found anywhere is the thrice yearly pathological conference on pathology and diagnosis, held in the Surgical Pathological Laboratory at Johns Hopkins University. This diagnostic conference was organized by Dr Bloodgood and is financed by the Chemical Foundation through the financial assistance of Mr. F. P. Garvan. The Fall Conference will be held September 19 to 24. Any doctor desiring to be put on the mailing list for these meetings should write Miss Maude E. Walker, Surgical Pathological Laboratory, Johns Hopkins University, Baltimore, Md.

FORMER PHOENICIAN WITH THE MENNINGER CLINIC

Cards have been received announcnig the addition to the staff of The Menninger Clinic, at Topeka, Kans., of Dr. Henry M. Benning, who will give special attention to problems of internal medicine in psychiatry. Dr. Benning is the son of Nelson W. Benning, general secretary of the Y. M C. A. at Phoenix, and has many acquaintances in Phoenix. Following the completion of his medical work at Columbia University, Dr. Benning has been with the Roosevelt Hospital for three years.

WESTERN BRANCH OF AMERICAN UROLOGICAL ASSOCIATION

This meeting always attracts a number of men from the Southwest. They held a very successful meeting in Portland on July 1 and 2, the attendance being the largest this Association has ever recorded, many of the members coming by plane. One plane started at Dallas, picking up passengers at Tucson, Los Angeles and San Francisco. Dr. A. W. Hunter of Vancouver was elected president, Dr F. S. Dillingham of Los Angeles, vice president; George W. Hartman of San Francisco, secretary-treasurer; Drs. W. G. Schultz (Tucson), M. B. Wesson (San Francisco), and Wirt B. Dakin (Los Angeles) members of the executive committee.

Dr. W. G. Schultz of Tucson presented a paper on Renal Tuberculosis. Dr. David M. Davis of Phoenix attended the meeting and participated in the discussions. Dr. H. M. Purcell of Phoenix was elected to membership in the Association. The 1933 meeting will be held in Vancouver, B. C.

LOCATION OPEN IN TEXAS

Dr. T. E. Standifer, director of the Standifer Sanatorium, at Turkey, Texas, states that he is willing to receive proposals for an association in practice with him. He wishes a man from 50 to 55 years of age, to whom he would consider trading a half interest in his sanatorium and equipment for a suitable home in Arizona. Surgical experience is not necessary. as this can be caquired under Dr. Standifer's direction. Those interested should write directly to Dr. Standifer.

COCOMALT

Cocomalt, a powdered food for the preparation of table beverages, manufactured by R. B. Davis Company, Hoboken, N. J., has been accepted by the Committee on Foods of the American Medical Association, under the following descriptions:

Manufacture.—Cocoa (including added irradiated ergosterol), sucrose, and skim milk and egg powders are thoroughly mixed with malt syrup and vanillin flavoring. The mixture is dried at a relatively low temperature to avoid destruction of the vitamin and diastatic values. The finished product is ground, bolted and automatically packed in an atmosphere of carbon dioxide in hermetically sealed containers. The carbon dioxide composes about 75 per cent of the gas mixture in the container.

Calories.—3.9 per gram; 111 per ounce.

Vitamins.—Vitamin D is incorporated in Cocomalt (under license by the Wisconsin Alumni Research Foundation) to the extent of approximately 39 Steenbock units per ounce. Biologic assay shows the presence of from 40 to 45 Steenbock D units per ounce.

Claims of Manufacturer.—Especially intended for the preparation of table beverages with milk. Cocomalt enhances the food value and flavor of milk. Many who dislike plain milk, especially children, invalids, convalescents and the aged, enjoy Cocomalt-milk beverage. One ounce of Cocomalt, which is recommended for each glass of beverage, contains from 40 to 45 vitamin D units (Steenbock) and richly contributes to the vitamin D dietary needs of the body. A hot beverage promotes relaxation. "A hot Cocomalt" before retiring is an aid to restful sleep.

SIMPLIFYING SUMMER INFANT PROBLEMS

Vacation travel presents fewer difficulties in caring for infants on S.M.A. Instead of using milk from dairies of unknown standards, the mother in feeding S.M.A. is using a food made from milk which her physician knows to be produced under strict sanitary requirements and rigorous inspection.

Refrigeration is unnecessary because individual feedings of powdered S.M.A. may be made up as needed. If the supply runs out, S.M.A. is available virtually everywhere in the United States in prescription pharmacies from Skowhegan to Hollywood. S.M.A. is not a grocery product for adults, but a scientific antirachitic breast milk adaptation designed for infants.

S.M.A. is made to resemble nature's own formula, breast milk, as closely as modern scientific knowledge and laboratory control can accomplish—certainly closer than a trial and error formula.

AN ACT TO CREATE A BOARD OF EXAMINERS IN THE BASIC SCIENCES

(Note: This is a copy of the bill which the Committee on Public Welfare of the Arizona State Medical Association proposes to introduce in the coming session of the State Legislature.)

Section 1. Basic Sciences Defined; Practicing Healing and Practice of Healing Defined: Wherever the term "Basic Sciences" is used in this act and not otherwise specifically defined, the same shall be understood and construed to mean and include all matters pertaining to anatomy, physiology, pathology, chemistry, bacteriology and hygiene. Wherever the term "Practicing Healing" or "Practice of Healing" is used in this act, unless otherwise specifically defined, the same shall be understood and construed to mean and include any person not hereinafter excepted from the provisions of this act who shall in any manner for any fee, gift, compensation or reward or in expectation thereof, engage in, or hold himself out to the public as being engaged in the practice of medicine or surgery, the practice of osteopathy, the practice of chiropractice, analysis, treatment, correction or cure of any disease, injury, defect, deformity, infirmity, ailment or affliction of human health or disease, or who shall for any fee, gift, compensation or reward, or in anticipation thereof, suggest, recommend or prescribe any medicine, diet or any form of treatment, correction, or cure therefor; also any person or persons, not hereinafter excepted from the provisions of this act individually or collectively who maintain an office for the reception, examination, diagnosis or treatment of any person for any disease, injury, defect, deformity, or infirmity of body or mind, or who attaches the title of doctor, physician, surgeon, specialist, M. D., M. B., D. C., D. O., or any other word abbreviation or title to his name indicating or designed to indicate that he is in the practice of healing.

Section 2. Board of Examiners in Basic Sciences: Created and Established: There is hereby created and established a board to consist of five members, citizens of the state of Arizona, to be known and designated as the State Board of Examiners in the Basic Sciences.

Section 3. Same; Members, Appointment, Terms of Office; Vacancies, Oath of Office. The Board of Regents of the University of Arizona shall appoint from the Faculty of the University, five persons to serve as members of the Board of Examiners in the Basic Sciences. These members shall be chosen from the professors, associate professors or assistant professors of the Faculty. The first appointments shall be made as soon as may be after this act shall take effect. The terms of office of the members first appointed shall begin when they are appointed and qualify and shall continue thereafter for the following periods: Two members until January 1st, 1934; two members until January 1st, 1936, and one mem-

ber until January 1st, 1938. Upon the expiration of such terms and all terms thereafter, the Board of Regents shall appoint a successor to the member whose term expires for a term of six years. Vacancies in said board shall be filled by appointment by the board of regents within 60 days after such vacancies occur for the balance of the unexpired term and each member shall serve until his successor qualifies. Each member of the board before entering upon the discharge of his duties shall take, subscribe and file with the Secretary of State, the oath of office perscribed by the constitution.

Section 4. Organization of Board; Duties. Within 30 days after the appointment of the members of the State Board of Examiners in the Basic Sciences provided for in Section 3 of this act, they shall assemble and organize by the election from their members of a president, a vice-president, and a secretary-treasurer, who shall each serve for one year or until their successors are elected and qualified. Said boards shall have authority to prescribe such reasonable rules and regulations relative to the examination of applicants in the basic sciences as may be found necessary for the performance of its duties. As to any matters coming under its jurisdiction the board in session may take such testimony as it may deem necessary in the exercise of its powers and performance of its duties under the provisions of this act, and any member of said board shall have the power to administer oaths in the taking of such testimony. Three members of the board shall constitute a quorum for the transaction of business. Said board shall have a common seal which shall be kept by the secretary, whose duty it shall be to keep a record of all proceedings of the board, including the register of all applicants for examination therein, preserving the names, ages, addresses, educational qualifications, and the result of their examination, which shall at all times be available for inspection by any parties in interest. Said board shall meet at the University of Arizona and there conduct examinations in the basic sciences four times each year, respectively on the first Tuesday in January, April, July and October, and may hold such other meetings at such times and places as the board may determine. Said board may appoint and fix the salaries of an assistant secretary and such other employes and shall have the power to employ such expert assistant or assistants as it may deem necessary to carry out the purposes of this act. Such employees shall hold their positions at the pleasure of the board. The compensation of each member of said board shall be $10.00 for each day actually spent in the performance of his duties, together with actual necessary expenses payable out of the general fund of the University. Examinations shall be in the basic sciences only, and may be both written and oral, and by demonstration or other practical tests, as the board may determine.

Section 5. Examinations: Examinations shall be of such a nature as to constitute an adequate test as to whether the person so examined has such knowledge of the elementary principles of such sciences as taught at the University of Arizona, in one year's instruction of thirty-six weeks, or as taught in one year's instruction of thirty-six weeks at any college or university accredited by the University of Arizona, or the equivalent thereof.

Section 6. Fees: Any person not hereinafter excepted from the provisions of this act desiring to practice healing in this state shall apply to the secretary of the State Board of Examiners in the Basic Sciences, on blank forms prepared and furnished by said board, to be examined in the basic sciences at the next examination therein following the making of such application and for a certificate of registration in the basic sciences accompanying such application with a fee of $20.00, and sufficient and satisfactory proof that the applicant is 21 years of age or over, is of good moral character and has an education equivalent to graduation from an accredited high school of this state, provided that no applicant shall be required nor requested to disclose in such application the professional college or university he may have attended nor the branch or system of healing which he intends to pursue.

Section 7. Certificate of Registration: If in such examination the applicant attains a grade of 75 per cent in each subject he shall receive a certificate of registration in the basic sciences, signed by the president and secretary and sealed with the seal of said board. If he fails in one or two subjects only, he may be re-examined in the subject or subjects in which he failed, at any examination within one year without further application or examination fee, and upon attaining a grade of 75 per cent therein, he shall receive his certificate of registration in the basic sciences. If he fails in three or more of the subjects, he may make a new application for examination in all subjects and again pay the secretary-treasurer of said board the examination fee of $20.00.

Section 8. Who Must Secure Licenses: Any person not hereinafter excepted from the provisions of this act who was lawfully authorized to practice healing, as by this act defined, in this state on the date this act takes effect, and who was on that date regularly licensed or registered in the manner thereby provided, shall upon application as herein provided, receive from the State Board of Examiners in the Basic Sciences a certificate of registration in the basic sciences without examination therein; provided, however, that on or before January 1st, 1934, every such person shall apply to the secretary of said board for such certificate of registration, accompanying such application with sufficient and satisfactory evidence that he was, on the date of the passage of this act, lawfully authorized to practice healing or regularly licensed or registered according to law in the particular branch or system of healing by him pursued and specifying in said application the branch or system of healing pursued by the applicant, the school from which he graduated, if any, and the date of graduation from said school together with a fee of $3. Such certificate of registration shall recite that registration is made solely as a per-

son lawfully authorized to practice healing or licensed or registered according to law on the date this act takes effect, and that same was issued without examination in the basic sciences. Any person entitled to a certificate of registration in the basic sciences without examination therein pursuant to the provisions of this section who fails to apply for same in the manner herein provided shall not receive such certificate of registration except upon application for examination and actual examination in the basic sciences as hereinbefore provided; provided, however, said State Board of Examiners in the Basic Sciences may after the first day of January, 1934, in its discretion upon payment to it of a fee of $25 issue a certificate of registration in the basic sciences without examination to any person who would have been entitled thereto pursuant to the provisions of this section upon applying therefor on or before the first day of January, 1934, and who makes application therefor in the manner herein provided and shows good cause why said application was not made on or before the first day of January, 1934.

Section 9. Applicants from Other States Need Not Take Examinations in Certain Cases: The State Board of Examiners in the Basic Sciences may issue a certificate of registration in the basic sciences without examination therein to an applicant who presents sufficient and satisfactory evidence of having passed examinations of the basic sciences as defined by this act before the National Board of Medical Examiners or a legal examining board of officers of another state or of a foreign country if the standards of such other state or foreign country are determined by said board to be as high as those of this state, and if such other state or foreign country shall be then according a like privilege to persons licensed to practice healing under the authority of the laws of this state.

Section 10. Disposal of Fees: The secretary-treasurer of the board of examiners of the basic sciences shall on or before the 15th day of January, April, July and October, transmit to the bursar of the University of Arizona a record of all expenditures of the board for the previous quarter of the year, with all fees collected during such previous quarter, the same to be credited to the general fund of the University.

Section 11. Appeal from Board's Decision. Any applicant who has been denied examination by the board may within 30 days after such denial appeal to the superior court of Pima County and such court shall on such appeal inquire into the cause of such denial. If in the opinion of the court admission to the examination was refused without just cause, the court may order the board to examine the applicant. Notice of an appeal from the denial of the board of the right to examination shall be served by leaving with the secretary of the board an attested copy thereof within thirty days after said board has notified the applicant of its refusal to examine him. Hearings of such appeals shall proceed in accordance with such rules as the court may determine.

Section 12. Certificates—Void * * * Cancellation: Any basic science certificate which is issued contrary to this act shall be void. The certificate issued by State Board of Examiners in the Basic Sciences shall be automatically revoked by the revocation of any license issued to such person to practice the healing art or any branch thereof.

Section 13. Recording of Certificates: Each certificate issued by the Board of Examiners in the basic sciences shall be recorded by the secretary with the Secretary of the State Board of Health.

Section 14. Penalties—No Certificate: Any person who shall practice the healing art or any branch thereof without having obtained a valid certificate from the State Board of Examiners in the Basic Sciences, except as otherwise authorized by section 18 of this act, shall be fined not more than $100 or imprisoned not more than three months, or both in the discretion of the court.

Section 15. Fraudulent Certificates: Any person who shall obtain or attempt to obtain a basic science certificate by any dishonest or fraudulent means, or who shall forge, counterfeit, or fraudulently alter any such certificate, shall be fined not more than $100 or imprisoned not more than three months, or both, in the discretion of the court.

Section 16. Practicing Without Certificate. Penalty: Any person who shall obtain or attempt to obtain a license to practice the healing art or any branch thereof from any board authorized to issue any such license, without presenting to said licensing board a valid certificate issued by the State Board of Examiners in the Basic Sciences, as in this act required, shall be fined not more than $100 or imprisoned for not more than three months, or both, in the discretion of the court.

Section 17. Penalty for Issuing Invalid Certificates: Any person who knowingly issues or participates in the issue of a license to practice the healing art or any branch thereof to any person who has not presented to the licensing board a valid certificate from the State Board of Examiners, in the Basic Sciences, or to any person who has presented to such licensing board any such certificate obtained by dishonesty or fraud, or any forged or counterfeit certificate, shall be fined not more than $100 or imprisoned for not more than three months, or both, in the discretion of the court.

Section 18. Investigation. Duties of Officers: The secretary of the State Board of Health shall investigate any supposed violation of this act and report to the proper county attorney of the causes that in his judgment warrant prosecution. Every police officer, sheriff, and peace officer shall investigate supposed violations of this act and apprehend and arrest all violators thereof. It shall be the duty of the attorney general and of the several county attorneys to prosecute violations of this act.

Section 19. Callings Exempt: This act shall not be construed as applying to optometrists, dentists, midwives, or nurses practicing within the limits of their respective callings; nor other persons licensed to practice the healing arts or branches thereof in

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this state when this act takes effect, nor to affect the practice of their religious tenets by members of any church, provided they do not administer drugs or medicine, nor perform surgical or physical operations nor assume the title of or hold themselves out to be physicians or surgeons.

Section 20. Limitation of Provisions: No provision of this act shall be construed as repealing any statutory provisions now in force at the time of its passage with reference to the requirements governing the issuing of licenses to practice the healing arts or any branch thereof, except as herein provided. The unconstitutionlaity of any part of this act shall not be construed as invalidating any other part thereof.

INFORMATION ON "THE BASIC SCIENCE" BILL

Q: What is the Basic Science Bill? A: The Basic Science Bill will provide that an examination in the Basic Sciences must be taken by every candidate for a license to practice any form of the healing art in Arizona. This will insure that whatever the kind of doctor the State admits to practice will have at least a minimum of educational advantages.

Q: What are the Basic Sciences? A: The Basic Sciences are Anatomy, Pathology, Physiology, Chemistry, Bacteriology, and Hygiene.

Q: What is Anatomy? A: Anatomy teaches the structure and mechanism of the human body.

Q: What is Pathology? A: Pathology teaches of the changes which disease produces in the body.

Q: What is Physiology? A: Physiology explains the action and function of the organs and tissues of the body.

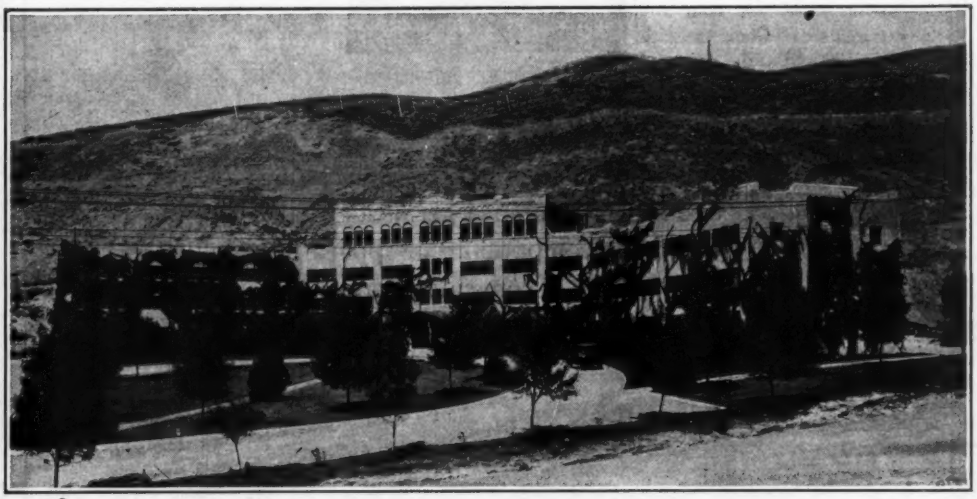
Q: What is Chemistry? A: Chemistry is the science which teaches of the elements of which all matter is made. The science of diet must naturally depend upon chemistry.

Q: What is Bacteriology? A: Bacteriology is the study of germs—the causes of diseases.

Q: What is Hygiene? A: Hygiene teaches how to avoid disease, how to obtain good water and milk supplies, how to properly dispose of sewage and other waste and how to prevent and check infectious diseases, etc., etc.

Q: Of what use is all this knowledge to the cultists who claim to heal without drugs or surgery? A: Frankly speaking, the medical profession honestly believes that the interest of society would best be served by a law prescribing a full course in a medical school for every person who practises any type of the healing art.

Only after acquiring a working knowledge of the basic principles in both health and disease is one in a position to decide what method of treatment is



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best. It is a sad commentary on the quality of our civilization that greater emphasis often seems to be laid, according to our views, upon proper plumbing than upon proper healing. One can form his own opinion of the kind of "Knowledge" taught in cultists schools from the fact that NOT A SINGLE REPUTABLE UNIVERSITY IN THE WHOLE WORLD RECOGNIZES THOSE SCHOOLS.

However, this is not the place to enlarge on this unpleasant subject. The fact is that the legislature has seen fit to allow certain cultists to treat disease, provided they do not use drugs or surgery. It may be argued that not much harm is caused by this law to the community at large. We maintain, however, that many epidemics of infectious disease owe their spread to lack of scientific knowledge and failure to recognize the dangerous nature of the disease. We believe that if all persons licensed to practice the healing art are compelled to be trained in the so-called basic sciences, there will be a greater chance of a healer not doing harm—and at least not helping to spread disease to make epidemics. The Basic Science Bill will raise the standard of all healers.

The Bill does not undertake to dictate to the cultist how to treat his patient. It does demand of a healer that he know what disease is and that he be able to recognize contagion when he sees it.

Q: Does this mean that all cultists will have to take the examinations in the Basic Sciences? A: No. The law is not retroactive. Therefore, the physicians and cultists already licensed will not be affected by this Bill.

Q: Will those who claim to cure disease by prayer have to take the Basic Sciences examinations? A: No.

Q: Who are going to be the examiners in the Basic Sciences? A: Members of the Faculty of the University of the State of Arizona. (Members of the medical profession, on account of their opposition to cultists on principle, will not be eligible to serve on the board of examiners.)

Q: This bill may be all right. But is this the opportune time to create a new board which would seem a new burden on the already overtaxed tax-payer? A: This new board will cost the tax-payer nothing. The entire expense will be covered by the examination fees. Indeed, it is probable that there will be a surplus for the general fund of the University.

Q: These cultists have been doing business in Arizona many years, and as far as we can tell, no great harm has been done to the community at large? A: During the past years, we have had several outbreaks of diphtheria, whooping cough, typhoid, and epidemic meningitis. A number of these cases were treated by the cultists without notifying the health authorities. They were discovered when physicians were called in before the patients died. It is reasonable to suppose that if the proper quarantine regulations had been enforced, the loss of life would

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have been much less and the outbreaks would have been checked much sooner.

Q: If that is so, why was not the Basic Science Bill introduced until now? A: The Basic Science Bill has been repeatedly introduced and as often lost in the political shuffle. We physicians, the sponsors of the Bill, innocently believed that inasmuch as the bill is in the interest of the public health, it would only be necessary for us to explain it to the law givers and they would surely vote for it. We have learned an important lesson—that politics is more powerful than common sense and public welfare. So this time we are going to play politics—in the interest of the community. This time the medical profession is well prepared and is going to exert its influence to the utmost to the end that the Basic Science Bill shall be enacted into law.

We are already assured of the support of public-spirited citizens and of many women's clubs throughout the state. We are undertaking a wide campaign of education to bring in line the less informed part of the voting population. Too long have the cultists had the use of the avenues of publicity all to themselves. From now on we also mean to engage in publicity. When the community is once aroused to the dangers to which they are exposed by the inadequate legal safeguards against the spread of epidemics, we know what it will do.

Q: Is it not poor business on the part of physicians to sponsor the Basic Science Bill? A: From time immemorial, the physician has considered it his duty to teach people how to prevent disease, though by doing so he was undermining the source of his income. Long before the word "Service" was coined, the medical profession inscribed the true meaning of "Service" into the medical Code of Ethics. The aim of scientific medicine is not only to get a patient well but also to *keep* him well. It was and is the medical profession that has taught people how to prevent smallpox, typhoid, diphtheria, and so forth, though by so doing it lost a great share of its income. And when we are advocating the passage of the Basic Science Bill, we are only following our ancient tradition.

Q: How many states have a Basic Science law? A: Connecticut, Minnesota, Nebraska, Washington, Wisconsin, Arkansas, and the District of Columbia, had the law up to 1931, and in other states all persons are compelled to take the examinations given by the medical board, which of course includes the basic sciences.

Q: In these days of general economic distress, should not the Legislature devote all its time to purely economic questions? A: Considering that the Basic Science Bill tends to safeguard the public health, it is at least as important as any measure tending to protect the tax-payer's purse. There is also a further economic reason for the bill. Arizona's former prosperity depended on mining, cattle and other industries. These are much damaged; but

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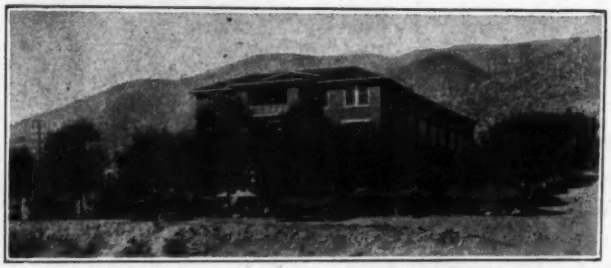

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And still one more consideration: When this Bill becomes a law, it will also have the effect of discouraging quackery and charlatanism in general. At present, a young man with an eye on business, may not see the advantage of spending many years in a medical school and hospital when he can make money by a short cut as a cultist. If even as a cultist he will be compelled to acquire a considerable amount of knowledge, he might learn to like scientific medicine and decide to spend a few more years in study and become a real physician.

Q: If the Basic Science bill becomes a law, will those seeking a license to practice regular Medicine also have to take the examination in the Basic Sciences? A: Yes, and this will help guard the state against poorly trained doctors of medicine, which is just as important as keeping out poorly trained cultists.

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And talk about a picture of health! I believe he would take first prize in any baby contest.

I'm going to bring him down to your office Wednesday as you suggested. That S.M.A. folder you gave me says even a breast fed baby should be under the supervision of a physician and I think myself that it's better to *keep* the baby well than to wait until trouble starts.

We certainly want to thank you for bringing our baby along so well, Doctor. It increases our confidence in you as our family physician. Tom has already "said it with dollars", but I wanted to thank you personally, too.

And I'm going to persuade Mrs. Brown,—that's my neighbor with the baby that's not gaining—to come along on Wednesday so you can prescribe the proper diet for *him* too.

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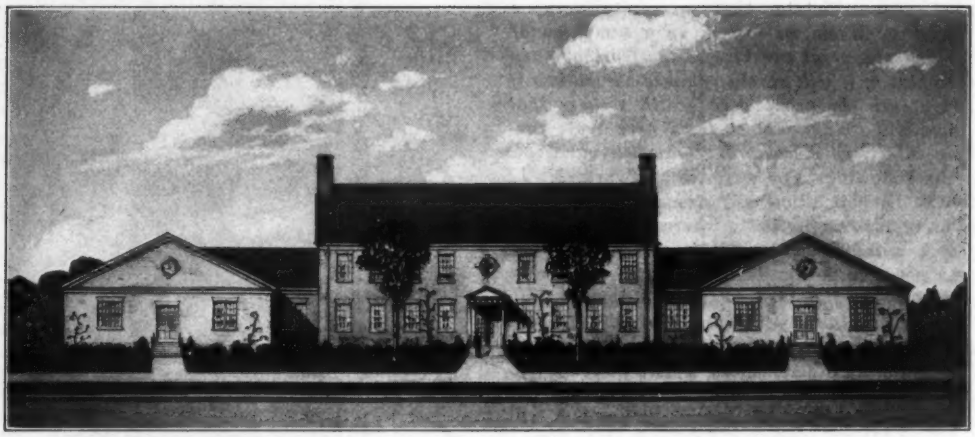

MERCK BUILDING NEW RESEARCH LABORATORY

Ground was recently broken for the erection of a research laboratory building at the works of Merck & Co., Inc., at Rahway, N. J. The project has been under consideration for some time. George W. Merck, president of the Company, brought it to the attention of the stockholders a year ago. The directors have authorized proceeding with the work at this time, moved by the consideration that it will provide increased employment and that the facilities are urgently needed. The research activities of the Company are at present being carried on in various parts of the large Merck plant—in many cases in make-shift quarters.

The building will be a Colonial type, brick structure, with a cenrtal section 40 ft. by 80 ft., of two stories and basement. On each end of this central section will be two one-story wings, 50 ft. by 100 ft. The wings will be connected with the central section by two one-story units, 10 ft. by 38 ft.

The south wing will be devoted to carrying on pure or fundamental research, for which three labaratories will be provided. Another laboratory will be fitted for bio-chemical research, and there will be an adjoining incubator room containing a sterilizer, incubator, and other necessary equipment. In a pharmacological laboratory the physiological action of various chemicals will be investigatde. Adjoining each of the laboratories will be offices for the chemists and pharmacologist in this section. There will also be a laboratory for micro-analysis, a microbalance room, an ordinary balance room and an ice-room.

The north wing will contain a large chemical labroatory, 50 ft. by 50 ft., suitable for twelve chemists carrying on applied research and development work. In this wing provision will also be made for carrying on studies on small scale plant operations—the step between research laboratory and factory.

The central section will contain on the first floor the offices and private laboratories of the research directors. In addition, there will be an optical and a physical laboratory; and a laboratory in which research wlil be carried out on the containers used for various chemicals.

Here also will be located the library, which will be an outstanding feature of the building. The ceiling runs up into the peak of the roof, giving full height for the stacks for books, which will also be

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carried into the attic spaces made available for this purpose. The arrangement of the library will provide for work tables and complete files of technical literature from all over the world. The work of the librarian and abstractors will be carried on in adjacent locations. The Patent Department offices also will be located on the second floor.

The basement of this section will contain a constant temperature and humidity room, a dark room, a combustion laboratory, a glass-blowing room, and a carpenter shop. Provision has been made also for a chemical and glass-ware storeroom, a machine room and a battery room.

Merck & Co. Inc.'s decision to carry out such an ambitious plan at this time adds another to the growing list of American chemical companies who have determined not to allow the period of depression to diminish their activities in research and technical endeavor. It is interesting to observe the manner in which the forward-looking companies are meeting the present situation, as contrasted with the all too prevalent attitude during 1921, which in particular affected chemical companies adversely and led many to discontinue research staffs and abandon all development work. Dr. Hugh Taylor, head of the Chemical Department at Princeton University, recently took occasion to point out that the continued pursuit of scientific investigation by industrial concerns is one of the most encouraging signs in these times.

BOOK REVIEWS

CLINICAL ELECTROCARDIOGRAMS: Their Interpretation and Significance; by Fredrick A. Willius, B.S., M.D., J.D., in Medicine; Section on Cardiology, The Mayo Clinic; Rochester, Minnesota; and Associate Professor of Medicine; The Mayo Foundation, University of Minnesota. With 368 illustrations; Philadelphia and London; W. B. Saunders Company; 1929.

This is a book of electrocardiographs with the explanations thereof. It has 368 figures, all electrocardiogram tracings. It is an extremely valuable reference book, and is unequivocally recommended.

O. H. B.

CANCER: Its Origin, Its Development and Its Self-perpetuation; The Therapy of Operable and Inoperable Cancer in the Light of a Systemic Conception of Malignancy. A research by Willy Meyer, M. D., Consulting Surgeon to the Lenox Hill and Postgraduate Hospitals, New York Infirmary for Women and Children, etc.; Emeritus Professor of Surgery, N. Y. Postgraduate Medical School. Paul B. Hoeber, Inc., New York, 1931; $7.50.

This book is the compilation from the literature Dr. Meyers started to write as a paper, which soon grew into three, four, and a dozen, papers, and finally into this book. His conclusions are that cancer results from irritation and predisposition. He thinks that all persons whose bodies react with a higher

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than the normal degree of alkalinity are predisposed to cancer.

Part two, in which he discusses the relationship of alkalinity to the development of cancer, is difficult to read. The reviewer was unable to get a clear conception of the author's idea of the explanation; that Coley's fluid is beneficial to sarcoma because it reduces alkilinity. seems a bit difficult to comprehend. Every individual especially interested in cancer should study this book. O. H. B.

MEDICAL CLINICS OF NORTH AMERICA: (Issued serially, one number every other month. Volume 15, No. 5; (New York Number, March, 1932); octavo of 340 pages with 61 illustrations; per clinic year, July, 1931 to May, 1932; Paper, $12.00; Cloth, $16.00 net; Philadelphia and London; W. B. Saunders Company; 1932.

There are a number of excellent articles in this issue, among which may be mentioned: Early Treatment of Intracranial Hemorrhage in the Newborn; Chronic Familial Edema Affecting All Extremities; A Variant of Milroy's Disease; and Some Clinical Aspects of Radiology of the Heart.

The article which especially attracted attention of the reviewer was: The Clinical Aspects of Bright's Disease, by Dr. Herman O. Mosenthal. The author gives the modern classifications of nephritis with an understandable discussion of it. This article is worth the price of the volume. O. H. B.

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